RAILROAD GAZETTE

FRIDAY, JANUARY 11.

Accidents to Employes on the Massachusetts Railroads.

[From the Fifteenth Annual Report of the Massachusetts Railroad Commissioners, covering the year ending Sept. 30, 1883.]

Appendix C gives a table of railroad accidents in Massachusetts during the railroad year, resulting in death or serious injury. The whole number reported as injured was 524, being 110 more than the number for the year ending Sept. 30, 1882. Of these 61 were passengers, the number last year being 27. The number of persons killed was 191 against 163 for last year. Of this number 15 were passengers, 14 of whom died as the result of accidents caused by their own misconduct or negligence. One was killed without such negligence while riding as a favor on a freight train in violation of rule, but in accordance with a practice known to the managers of the road. It may, therefore, be said that no passenger riding in a passenger train has been killed during the year except from his own fault.

The number of employés injured, not fatally, was 203; the number killed was 62. The corresponding numbers for 1881-82 were 142 and 56. These accidents to employés are reported as follows:

While coupling or uncoupling cars	86
By train accidents	13
By falling from train	55
By overhead bridge	14
By various causes	97
Total	265

Of these, 192 were trainmen.

* * * * * * *

These figures, as usual, include all the accidents reported during the year ending Sept. 30, 1883.

The returns of the number of employés injured, unexplained, do injustice to some of the railroad companies. There is evidently a great diversity of practice in making these returns, some corporations reporting the slightest cases and others only giving the more serious ones. And it is not possible to secure uniformity in this respect, as something must be left to the discretion of the persons making returns.

The number of killed is a definite matter; and it will be seen that there is no such disproportion between the numbers killed on the different roads as appears in the numbers returned as injured. The best basis for a comparison is the freight mileage of each railroad, as most of the accidents to employés occur in the handling of freight, and they would naturally bear a close proportion to the amount of freight business. A few comparisons on this basis will help to correct the false impressions given by the tables. The following is compiled for that purpose. The comparison necessarily includes all freight-train miles, whether in or out of Massachusetts, and therefore the number of employés killed on the whole road is given in each case.

Road.	Freight train miles, including freight train switching.	No. of employes killed.	Deaths to freight miles.
Fitchburg	1,371,307	4	1 to 340,000 +
Boston & Albany	3,582 822	13	1 to 275,000 +
Old Colony	1.289,855	6	1 to 215 000 +
Eastern	1,185,061	6	1 to 197,000 +
Boston & Maine	762.586	4	1 to 190,000 +
Boston & Providence	297,385	2	1 to 148,000 +
Boston & Lowell	703,777	7	1 to 100,000 +
New York & New England	1,867,249	28	1 to 66,000 +

It is hardly necessary to say that such a table as the above compiled from the returns of a single year, by no means shows the comparative mortality of employés on the different railroads. A long term of years would be necessary for that. Its only purpose is to correct the wholly incorrect estimate that would be formed by a mere comparison of the number returned as injured on each road. The tendency of such a comparison would only be to condemn unjustly those that had been most scrupulous in reporting slight casualties.

The great number of accidents that are due to the coupling and uncoupling of freight cars, continues to be a subject of regret. It is probable that the number returned as 86 should be increased by adding some of the 97 which are stated as resulting from various causes. The Board has more than once called attention to the subject with the hope that something might be done to lessen the amount of suffering and death arising from this cause, but it has been impossible, hitherto, to procure legislative action. The Board acknowledges now, as before, the difficulty that attends legislation on this subject, and the fact that the adoption of life-saving devices in one state only diminishes the number of accidents, while the freight cars of other states are, as they always must be, freely used upon its roads. We have never ventured to recommend any movement except a gradual one affecting only cars that should be renewed or repaired. But it has seemed to us that a partial improvement is better than none, and that even to save a percentage of the limbs crushed and the lives lost is worth an effort.

We have also recognized the fact that no device should be approved which would not work well with every other approved device, and especially with the old link and pin. And inventors also have recognized this, and have always presented couplers that could be so used.

It has also been hoped that when such a commonwealth as Massachusetts should join Connecticut, which has the honor of leading in this humane movement, its example might have weight with other states. It is perfectly true that everything cannot be accomplished until more than thirty legislatures have acted in this matter, but to us this has seemed to be a reason for prompt action, rather than for waiting until the other thirty shall have legislated with one accord. It has seemed to the Board an unsound argument that one state should do nothing, because it cannot do all. And the natural tendency of such an argument is to throw upon Congress the duty of legislating for the protection of train hands engaged in inter-state commerce. For many reasons it seems to us better that the desired end should be obtained by the harmonious action of state governments, rather than by the intervention of federal authority.

One reason for delay that has hitherto been urged with some success, has been the hope that the Master Car-Builders' Association would agree upon some one standard freight coupler which would be adopted by all the railroad companies of the country, and so prevent the necessity of legislation. But the annual meeting of this Association for 1883 has been held without any advance toward an agreement upon this subject; and it seems to remain in the same condition in which it stood, when, in 1874, a report in favor of automatic couplers was made by F. D. Adams, Esq., the excellent Master Car-Builder of the Boston & Albany Railroad, then acting as Chairman of the committee on that subject, and in 1875, when another report was made by him recommending the adoption of some self-coupler.

Since that time, thousands of brakemen have been killed or maimed in the United States for want of self-acting couplers. While the builders deliberate the brakemen perish.

Reliance has been placed on the action of this justly respected Association because its selection of a standard height for drawbars was so readily adopted. But it should be remembered that the adoption of a standard height cost nothing. Uniformity was clearly desirable, but it did not involve the purchase of a patent right or the rival claims of inventors. In the selection of an automatic coupler the question is complicated by conflicting interests and in its adoption the obstacle of cost is a serious one. It is probable that the freight coupler question will never be satisfactorily settled until the law of liability of employers to employés has been thoroughly revised. The working of a just law covering this whole subject would be likely to supersede the necessity for special legislation as to couplers or drawbars.

The number of trespassers killed during the year was 93; the number injured, not fatally, 54. Of the whole number 112 were unlawfully on the track, and 33 were unlawfully in the cars. Only 3 are reported as suicides.

The number injured at highway crossings was 29; the number killed was 15. Of the whole number, 44, the number injured or killed at crossings with gates or flagmen was 18. The number at crossings not so guarded was 26.

Among the train accidents, 9 were rear collisions, resulting in 4 injuries and 1 death. Ten were butting collisions, resulting in 9 deaths and 36 injuries. In all, there were 19 collisions with 10 fatal injuries and 40 not fatal. Twenty-five derailments occurred, killing 1 person and injuring 14. Collisions with vehicles at crossings numbered 22, resulting in 2 fatal injuries to persons and 19 not fatal.

* * * * *

The amount of damages for personal injuries paid this year by the eight roads of standard gauge terminating in Boston is $138,580.33.

Contributions.

Railroad Curve Resistance.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Curve resistance must vary either as the degree of curvature or as the product of that degree by a coefficient. Practically it would seem to vary as the degree, the angular functions to which theory might require it to conform varying thus for such curvatures as are generally used. But the common belief is that it varies with cumulative increments as the degree greatens. Thus Wellington estimates the resistance of a 10 degree curve to be 20 times, and that of a 15 degree curve to be 75 times the resistance of a 1 degree curve. Looking closely at the thing this belief does not appear to be justified. The source and measure of the resistance being the obliquity of traction between the several links of the chain, as it were, no good reason occurs to the writer for assuming the resistance to be more than doubled when said obliquity is but doubled. If the cause be twofolded only why should the effect be manifolded?

Taking this resistance to vary as the degree of curve, its amount will manifestly vary as the power required to move the train on a straight line varies. The drag of the train develops and conditions the curve resistance somewhat, as the drag of a boatman on the free end of a hawser develops and conditions its friction round the snubbing post. But the drag of a train depends on its density partly, partly on rolling friction, and partly on the resistance due to gravity. Hence the weight of the train and the resistances due to gravity and friction on tangent must enter as factors into any formula for determining the amount of curve resistance.

Another factor of great importance remains to be considered, namely, the length of the train. On a straight-surfaced tangent each car in a uniform train passes forward the drag of those behind it without disturbance, in any kind or degree, of its own contribution to the general drag. It acts as a link simply. But on a curve the lateral resistance of each car, by reason of the obliquity of transmission, is reproduced on each car before it, and the foremost car feels the lateral resistances of all behind it, seeing that the accumulated drag of those resistances must pass through it to the engine at the same obliquity which originally caused them; as, in the sport called "tug of war," so long as the rope remains straight each man's tug is uninfluenced by his fellows; but if those fellows "swerve aside from the direct forthright," the leader must withstand the indirection of the whole tug in his rear. Thus, while the resistance of a uniform train on tangent is made up of a series of equal units, and may be represented graphically by a straight line, the cumulation of strain on the link pins from rear to van having no effect on that resistance, it would appear that the additional resistance of such a train due to curvature is made up of a series of unequal constituents—molecular on a rising scale instead of atomic, so to speak—and must be represented graphically by a triangular surface instead of a line, said triangle expanding forward in exact proportion to the cumulation of strain in the link pins and similarly to the cumulation of strain in the braces of a straight truss. The sum of this series, l being the length in stations, is $(l + 1)\ l \div 2$, which factor should enter into any formula for the determination of curve resistance, the cumulative property being assignable to it more justly than to the degree of curvature, in the writer's opinion.

Combining these factors and calling w the density of train in tons per foot run, r the resistance in pounds per ton on tangent, d the degree of curve, l the length of train in stations, and x a coefficient derivable from experience or experiment, the additional resistance due to curvature would be given in pounds per ton by the formula $x\ w\ r\ d\ (l+1)\ l \div 2$, in cases where the train is not longer than the curve and is supposed to be dragged around it. Provisionally I make $x = 0.001$, and append two examples to illustrate its application:

1. *Tyrone & Clearfield Railroad:* Engines worked their best under favorable conditions; speed 8 to 10 miles per hour. All short tons. Engine and tender, 74 tons; weight on drivers, 40 tons; total train weight, including engine, 384 tons; length, 350 ft.; rolling friction, 7 lbs per ton; grade, 120 ft. per mile; curve, 10 degrees. Hence $w = 1.1$; $r = 53$; $d = 10$; $l = 3.5$. From these values the curve resistance appears to be 4.6 lbs. per ton, and the tractive power exerted 22.120 lbs., or 0.276 the weight on drivers.

2. *Same road and Engine:* Total train weight, 300 tons; length, 720 ft.; grade, 148 ft. per mile, curve, 12 degrees. Hence $w = 0.42$; $r = 63$; $d = 12$; $l = 7.2$, and from these values the curve resistance appears to be 9.4 lbs. per ton, indicating the tractive power exerted to be 21.720 lbs., or 0.272 the weight on drivers. This formula, applied respectively to Wellington's examples of ordinary practice, Tables xxvii., A and B, and to what may be considered, on the whole, extraordinary performances in Baldwin's Catalogue for 1881, indicates the following percentages of the weight on drivers to be exerted.

WELLINGTON'S EXAMPLES. No.	Percentage of weight on drivers.	BALDWIN'S EXAMPLES. No.	Percentage of weight on drivers.
1	0.20	50	0.20
2	0.20	51	0.19
3	0.19	52	0.25
4	0.14	53	0.29
5	0.20	54	0.25
6	0.18	55	0.30
7	0.17	56	0.30
8	0:19	57	0.30
9	9.18	58	0.25
10	0.13	59	0.25
11	0.24	60	0.28
14	0.23	61	0.29
15	0.19	62	0.30
16	0.42	63	0.21
17	0.20	64	0.22
18	0.13	65	0.15
19	0.19	66	0.40
20	0 15	67	0.33
21	0 20	68	0.28
22	0.14	69	0.34
23	0.12	70	0.19
24	0.21	71	0.21
25	0.11	72	0 34
26	0.18	73	0.23
27	0.21	74	0.23
29	0.14	75	0 37
30	0.16	76	0.26
		77	0.27

The numbers of the Baldwin examples are my own and have no reference to the catalogue.

Much more might probably be said to purpose on this subject and tables given illustrative of results, but enough seems to have been advanced to serve the main object of the paper, which is to elicit the views of others and to obtain contributions, for the common benefit, of well defined performances, by which this formula may be improved, or thrust aside for a truer one. Only let us have something practical, unvexed by long f's or juggling d's!

HARRISBURG, PA. WM. F. SHUNK.

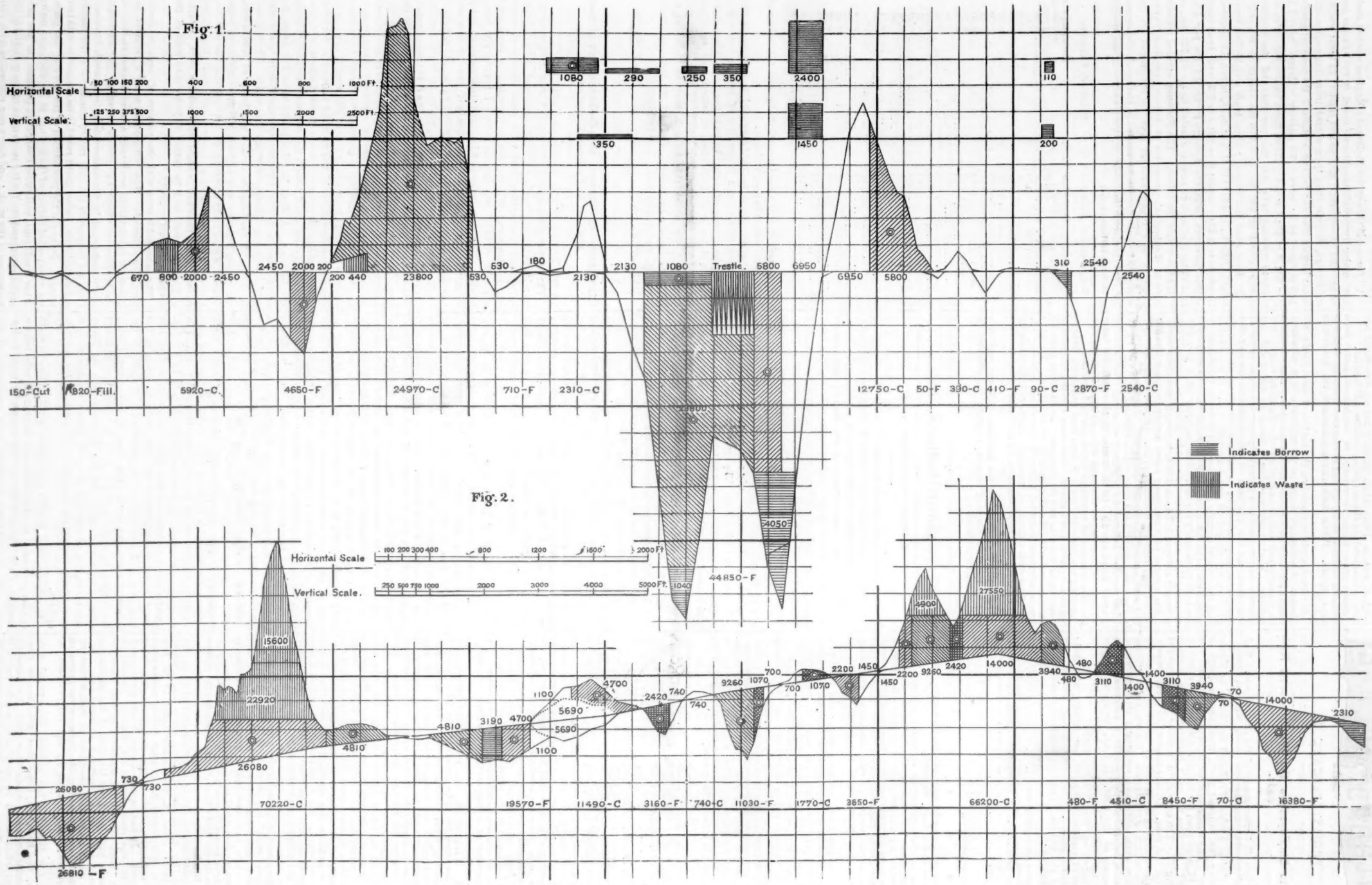
Distribution of Material and Determination of Haul and Lift in Railroad Construction.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The proper distribution of material, and the correct determination of the haul and lift for masses of material used in railroad construction, is of vital importance to railroads and contractors. Where land is valuable, or the ground along the right of way such as to forbid borrow-pits being located there, the deficiency in excavation material has to be supplied from other points on the line, causing long and expensive hauls. Where the neighboring ground admits of borrow-pits it becomes a question where to begin wasting excavation material in place of sending it to embankment, and where to commence borrowing material to make up the fills. Thus the distribution of the material forms a significant factor in the cost of the work. The oft misused maxim that extra time spent in carefully examining a problem before reaching a decision will result advantageously in the end, is certainly true in the present case, as in many other operations of the railroad engineer. An alternative preliminary survey for a short distance, or a trial line along some small branch or spur, may seriously change the location. A final location made upon the basis of a careful map with good topography (especially in heavy side-hill and broken country), will pay eventually. The engineer in charge of the location should not jump at conclusions, but reason logically, step by step, and make graphical memoranda, figuratively speaking, of his thoughts and motives. His work will then be of a higher merit, and those called in to examine the route, as laid out, and discuss it, or make a final decision, will be better able to take hold of the problem understandingly.

The same holds good with the question of material distribution on railroads. How often do we meet a resident engineer on construction work with a careful memorandum of the manner in which he intends to move the materials, easily understood by the contractor or company's foreman? Does not frequently the only record consist of a few hastily calculated data, jotted down roughly on the profile with lead pencil? Delays in the prosecution of the work at one place, the unexpected nature of the ground at another, and many other conditions, will cause changes to be made in the programme mapped out for the movement of the material at the beginning of the work; and every one connected with railroad construction knows that these changes, when not properly recorded at the time, cause the greatest trouble in settlements with contractors, all tending to show the necessity

Fig. 1.



DIAGRAMS FOR DISTRIBUTION OF MATERIAL IN CONSTRUCTION.

of more attention being paid during construction to matters of this kind.

In monthly estimates the question of haul is usually passed over roughly, and, to the discredit of the profession, final estimates of haul are frequently guessed at. The hauls are either estimated directly on the ground or ascertained from the centres of gravity of the various figures of the profile, fixed roughly by eye; as the profile does not represent a true comparison of the masses, especially in side-hill work, or where slopes and widths of road-bed change, this method stands self-condemned.

On the other hand, elaborate calculations and tabular deductions are made to obtain the accurate centres of gravity and limits of sections, which is very tedious work, entirely incomprehensible to the contractor, and an almost impossible method in case allowance is to be made for the numerous partial movements of certain sections, as borrow being used to bed or top off a fill, or a particular part of a cut is wasted or hauled to fill. With all the splendid array of figures, therefore, this method cannot be considered a good one, as it is not elastic enough to conform to all the different freaks of material movement, is far too tedious, and the record too complicated to afford a quick oversight. Next to obtaining an accurate and just settlement, the engineer should aim to have the record thorough and yet perfectly legible to contractors and railroad men.

Nearly every engineer can recall cases where the inevitable calculation of the material distribution and average haul was the *bête noire* of the office for months. The writer knows a case where on a large road with many residences, all calculations of haul were made by an "expert" at head-office; on another road a special assistant made the rounds of the different divisions at stated intervals and settled all such questions. In former years considerable attention was given to the "lift" of materials, *i. e.*, the vertical height that material has to be hoisted or moved, but at present few corporations retain this form of payment except for tunnels, shafts and similar work. Nearly all the roads, however, retain the overhaul clause in their specifications, except some of the large roads in the Eastern section of the country, where there is always a large body of trained and well known contractors on hand, familiar with the usages of the road, and ready to take work without a host of minute stipulations.

After these preliminary remarks, showing the importance of the question before us, an explanation of a short method, easily understood by any one capable of reading the ordinary centre-line profile, tested practically on several railroads, and illustrated by actual data from the field, may prove of of interest. It is not presented as a new method, for it is simply, like many so-called "new" methods, the practical application of a well known fundamental principle to the case in question.

A profile is drawn on ordinary profile paper, the spaces between vertical lines representing stations or distances on the ground, the spaces between horizontal lines representing some even number of square feet. At each station distances, proportional to the scale of square feet assumed, and representing the area of the cross section at such station, are carried up and down from a fixed grade line, corresponding to cut or fill, and the ends of these ordinates are connected. Any area on the paper inclosed by grade and profile lines is then exactly proportional to the actual number of cubic yards of material within those limits. A separate profile can be made on a larger scale than the usual profile, either with a level grade-line (see fig. 1), or on same scale and with same grade-line as the usual profile (see fig. 2). The spaces between vertical lines of profile paper (or ¼ in. on original draft) were assumed in fig. 1 to be 50 ft.; in fig. 2 to be 100 ft.; the spaces between horizontal lines of profile paper (or $\frac{1}{10}$ in. on original draft) equaled in fig. 1 25 square ft., in fig. 2, 50 square ft. Thus in the first case, an area on the original draft included between two vertical lines and five horizontal spaces (or one-sixteenth of a square inch) would be equivalent to 5×25 sq. ft.×50 ft. ÷27=231.5 cubic yards; in the second case 5×50 sq. ft.×100 ft.÷27=926 cubic yards.

It is now easy to fix the limits of the different masses moved and the quantities included between the limits, either by counting the spaces of the profile paper or by transforming the figures geometrically by planimeter, or by aid of previously tabulated lists of quantities from station to station. To settle haul and lift questions, the centre of gravity of each figure on the profile may be fixed by either of the following methods, according to individual views or the degree of accuracy required. It may be done either by eye, or by calculation, or by the method of graphical statics as explained in any text book on the subject.*

Another method is to transfer the figure to a piece of tolerably stiff paper, cutting it out carefully and balancing it on a knife edge in two directions. Where haul is only to be determined, it suffices to find only one balance line, provided it is parallel with the vertical lines of the profile. The writer has usually determined the limits of masses by counting the spaces on the profile and using previously tabulated quantities for exact results; while the method of balancing the figures on a knife edge to ascertain the centre of gravity is exceedingly simple, very quick, and as accurate as desirable.

After these remarks, a careful examination of the illustrations presented will show the advantages of this method. It is certainly practical, easily understood, and a perfect record. Partial material movements of certain sections, the location of borrow-pits in relation to the fill, and any particular feature of the actual movement, can be shown and included in the settlement. The record can be kept up monthly, and any changes in the original plans readily adjusted.

A few words about "average haul," "overhaul," "free straight haul," and "free average haul" may not be out of place, as these terms are being misused and misunderstood. The *haul of a particular body* of material is the horizontal distance between its centre of gravity in its first position and its centre of gravity in its second position. The *average total haul of a "section"* is equal to the quotient found by dividing the total sum of material moved on the section into the sum of the different products of the number of cubic yards of each body moved multiplied by its individual haul. *Overhaul* represents the distance that any particular body of material is hauled beyond a stipulated limit. If this limit is to be deducted from the total haul of each particular body of material, and the balance in each case considered as its overhaul, we speak of a *free straight haul.* The *average overhaul* of a section is then determined (as explained above) by considering these balances as the individual hauls of each body of material on the section. If this stipulated limit is not to be deducted from the haul of each particular body of material, but to be deducted only from the average total haul of the section (*i. e.*, the average of the total hauls of every body of material on the section), then we speak of a *free average haul.* The *average haul* of the section is then determined (as explained above) by deducting the stipulated free average haul from the average total haul of the section.

The free straight haul is more favorable to contractors, as all material hauled within the stipulated limit need not be considered. The free average haul would require, theoretically, that every shovelful of material be considered (even if only thrown a few feet, as in side-hill work), while it does not give a contractor a fair chance to bid, and does not afford a true comparison of the amount of extra work to be done, if we assume that up to a certain limit the cost of hauling remains about the same.

The illustrations presented are based on a free straight haul. It is easy to adapt the method to a free average haul problem, or to questions of lift and haul combined, as in tunnels, shafts, etc.

In conclusion attention is drawn to the fact that this profile of quantities is a great help in fixing grade lines definitely, and should always, when dealing with heavy work (especially side-hill and broken ground sloping unevenly) and with varying slopes and widths of road bed, be dotted along with the centre-line profile on the same paper. Progress profiles would also be nearer the truth if prepared on the profile of quantities in place of the centre-line profile.

WALTER G. BERG.

MAUCH CHUNK, PA., November, 1883.

* See also practical application of the same in article by the undersigned, *Scientific American* Supplement, Vol. V., No. 108, Jan. 26, 1878.

Fig. 3.

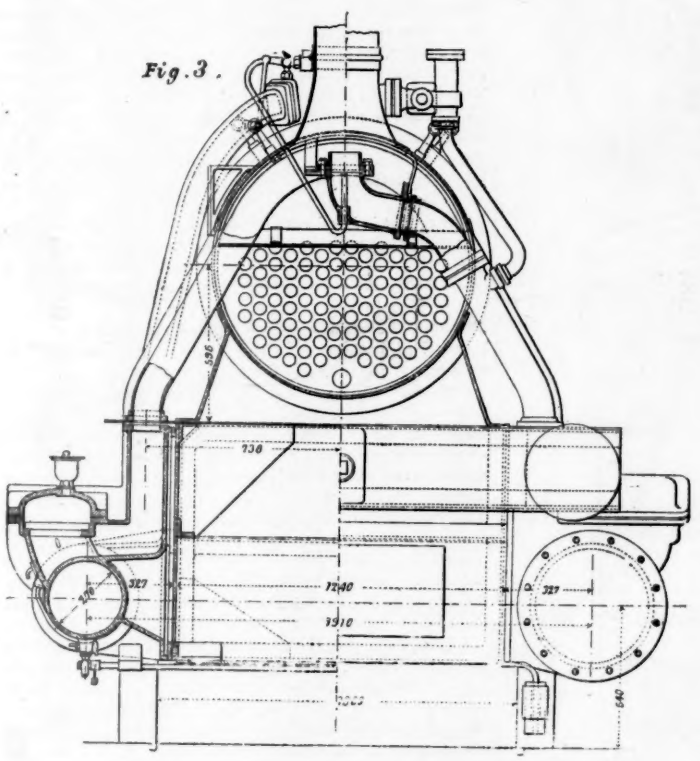
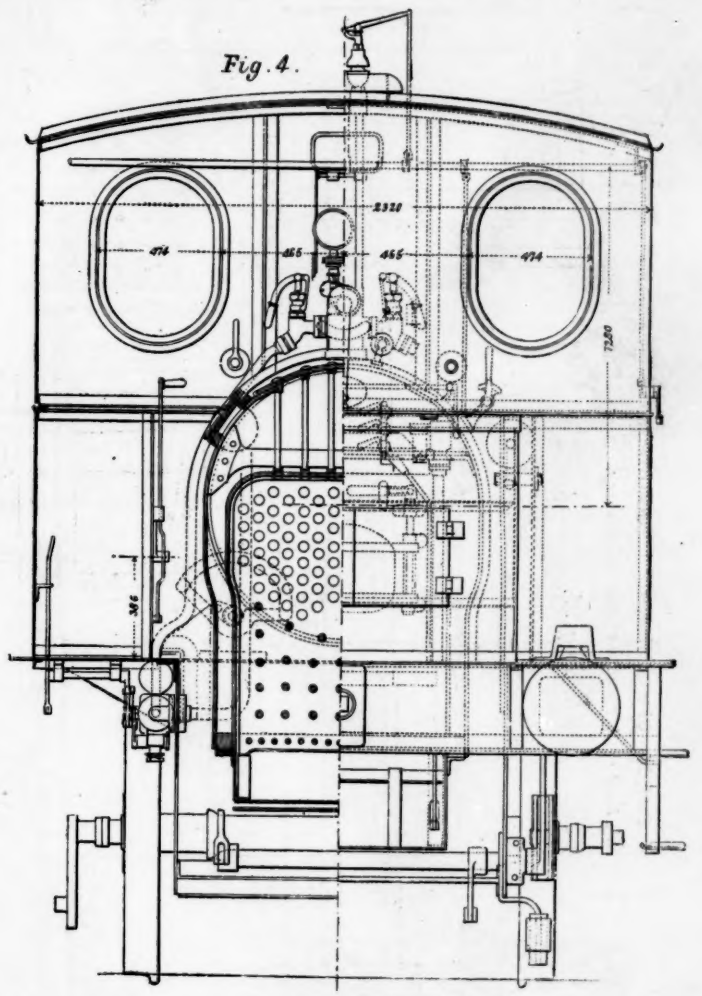


Fig. 4.

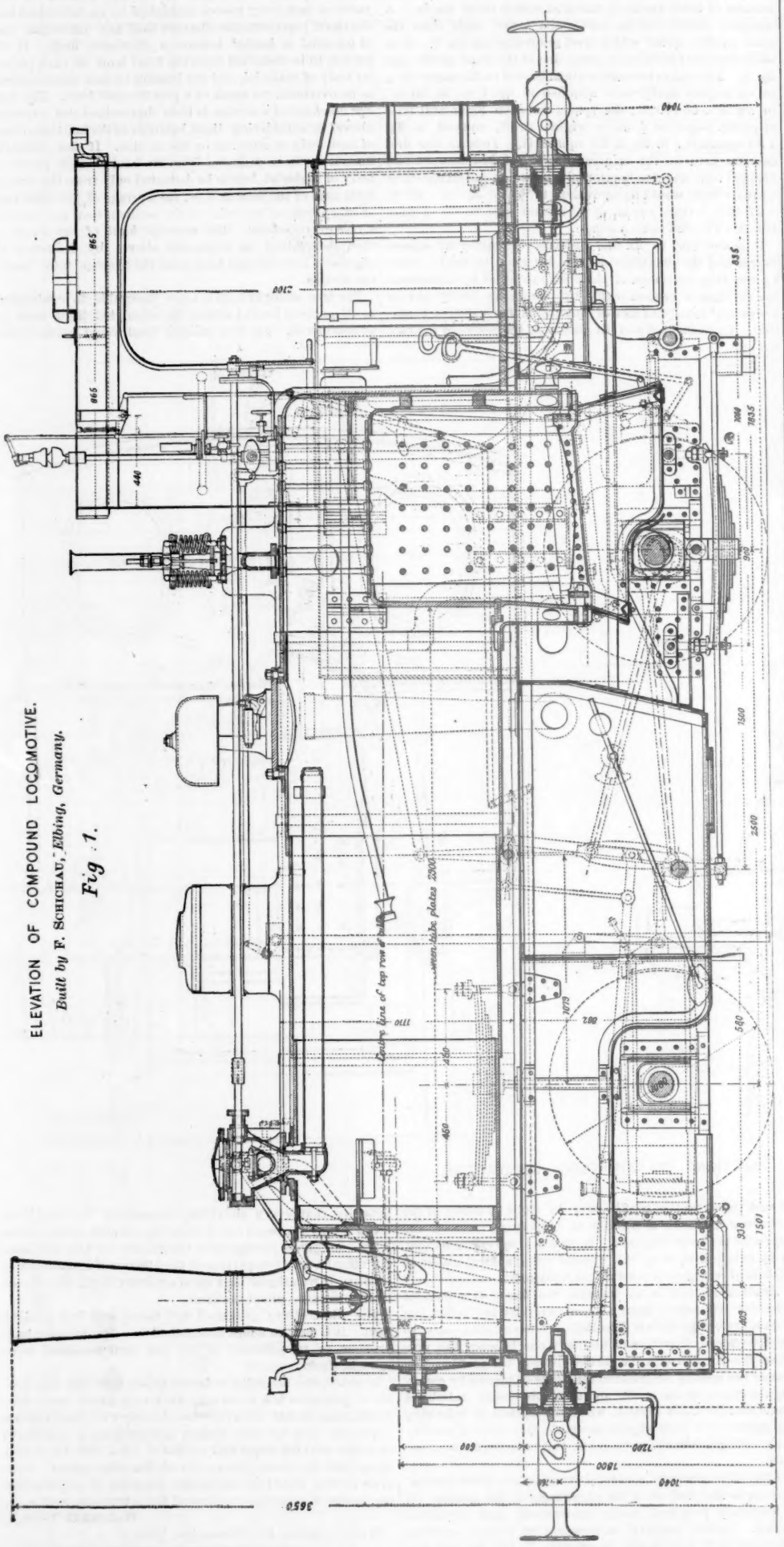


SECTIONS OF COMPOUND LOCOMOTIVE,

German Compound Locomotive.

A compound locomotive was exhibited at the Amsterdam Exhibition by Mr. F. Schichau, of Elbing, Germany, and of this engine we give illustrations this week. Compound locomotives have been built by Mr. Schichau for some years past, and have so far met with great approval on those lines where they have been in regular use. About two engines, built in 1880 for the Hanover-

ian Government Railways, from the designs of Herr von Borries, the direction of that line expressed itself very favorably in January, 1881, stating that while in other respects they had given equal satisfaction to ordinary engines, in point of fuel a saving of 16.5 per cent. had been proved by careful comparison with other new



ELEVATION OF COMPOUND LOCOMOTIVE.
Built by F. Schichau, Elbing, Germany.

Fig. 1.

non-compound locomotives of equal power and doing similar service. Two more built soon afterward for the Royal Eastern Railway of Prussia, from Mr. Schichau's own designs, and identical with the one we now illustrate, also met with a very favorable reception, and one of these was tried on two different lines against an engine of approximately equal power, when a saving in fuel in one case of 13.4 per cent. and in the other of 18.9 per cent. was found in favor of the compound system. The absolute coal consumption for the compound locomotive per mile on these trial trips was 15.6 lbs. in the former and 13.4 lbs. in the latter case. Since then a number of similar compound engines have been built for different lines by Mr. Schichau. Generally speaking, they give satisfactory results as to economy and are capable of being worked with a wide variation of power, and their rapid adoption would show that they give satisfactory results.

So far all these compound locomotives have been of a small type, built for standard gauge, but of comparatively small cylinder power, and chiefly intended for local traffic. Small four-wheeled engines are much used in Germany for working light trains on branch lines, which, being often built for military or strategic purposes, have but a light traffic. The engine under notice has a high-pressure cylinder 10⅝ in. and a low-pressure cylinder 17 in. diameter, with a stroke of 21⅝ in.; it is, however, worked at a high pressure, viz., 160 lbs. The engine has outside cylinders and Allan valve gear. The cranks of the two cylinders are set at right angles, the valve gear being so arranged that the point of cut-off in the two cylinders is always the same. Steam enters the high-pressure cylinder from the boiler by the throttle shown in Fig. 1, then passes by the exhaust pipe, which acts as the receiver, into the low-pressure cylinder, and after doing work there passes into the low-pressure exhaust fitted with the usual blast nozzle, and a small auxiliary blast pipe for live steam. Should the cranks at starting stand in such a position that steam has to be admitted directly into the low-pressure cylinder, the starting valve or regulator opens the port to a small pipe fitted with a reducing valve, leading steam of reduced pressure direct into the intermediate receiver and into the low-pressure cylinder. We understand that no difficulties whatever have been experienced with starting these engines.

All piston-rods, connecting and coupling-rods, and all pins are made of steel, and the engine is a very good job throughout. The indicator cards show the distribution of steam and the slight loss of pressure in the imtermediate receiver, which is probably due to the fact that this receiver, or, correctly speaking, the high-pressure exhaust pipe, is placed in the smokebox, where the steam is slightly superheated. Both cylinders are supposed to do an equal amount of work. The piston-rods are coupled by long connecting rods to the hind wheels, while coupling-rods are placed inside and the counter-crank carrying the eccentrics for the valve gear is placed outside the connecting rod.

The boiler is of wrought iron and is constructed for a working pressure of 160 lbs. The barrel has a mean diameter of 3 ft. 2⅝ in. and consists of ¼ in. plates. The firebox is of copper, stayed with copper stays, except the top two rows, which are of iron, placed 4 in. pitch. The flat firebox crown is stayed to the outer round shell by screwed stays; the box has a solid iron foundation ring and contains 8 square feet of grate surface. All mudholes and cleaning doors, as well as many of the fittings, are attached to the boiler on metallic joints only, no packing material being used.

The engine is fitted with a sandbox, bell, and hand brakes, and carries a supply of coal and water. The tank is underneath the barrel of the boiler, and its sides are formed by the plate frames of the engine. This style of tank has been largely used in Germany, and to a limited extent in England, but the strains on the frames seem likely to cause leakage, while there is no saving in weight over a saddle tank placed above and round the barrel of the boiler.

The main surfaces of a saddle tank, being curved, will better resist the tendency of the weight of water to change their form than flat plates of greater thickness, and as little staying is required in a saddle tank it is generally lighter than a rectangular tank containing the same quantity of water. The tank of the engine in question is fitted with a float, which actuates a pointer on a dial, indicating the amount of water in the tank at any time. This arrangement, if always reliable, should be very convenient, and indeed it is difficult to see how an engineer could by any mere inspection ascertain the amount of water in a tank, the water level of which is so far beneath the filling hole.

A gong fixed over the manhole and struck internally by a moveable clapper, takes the place of a bell. The throttle valve is also of peculiar construction, being placed above and outside the barrel of the boiler. Though easy of access for repair, the condensation of steam, especially in winter, would appear to be a serious disadvantage, and likely to neutralize some of the economy sought for in compounding.

This engine affords another example of the German tendency to use iron as far as possible in place of timber. As is well known, iron has been much more largely used for ties in Germany than in any other country. In this country bumpers and cabs are invariably wholly made of timber; in England, "buffer beams," as they are termed, are made of iron as often as of timber, while cabs are generally made with iron front and sides and a wooden roof, while in this German engine the only timber used is in the engineman's platform.

For convenience of reference the chief dimensions are added below in a tabular form:

Diameter of high pressure cylinder	10⅝ in.
" low " "	17 in.
Stroke of pistons	21⅝ in.
Link motion	straight link.
" position	outside.
Boiler, mean diameter	38⅝ in.
Tubes, number	92
" diameter outside	2 in.
" length between tubeplates	9 ft. 3 in.
Steam pressure	160 lbs.
Heating surface: Tubes	406 sq. ft.
Firebox	35 "
Total	441 "
Grate surface	8 "
Proportion of grate surface to heating surface	1 to 55.
Wheels: Number coupled	4
Diameter	4ft 2⅛ in.
Wheel base	8 ft. 2⅝ in.
Contents of water tank	660 gals.
" coal bunker	1 ton coal.
Weight of engine empty	34,720 lbs.
" " in working order	46,480 lbs.
Total length of engine over all	23 ft. 3 in.

We are indebted to *Engineering* for many of the particulars contained in the above description.

Transportation in Congress.

In the Senate on the 7th:

The Secretary of the Interior transmitted, in obedience to the direction of the Senate, the correspondence on file in his department relating to the transfer of the land grant of the New Orleans, Baton Rouge & Vicksburg Railroad Co. to the New Orleans Pacific Railway Co.

Mr. Dolph, of Oregon, presented a petition of citizens of Oregon and Washington territory, praying for the forfeiture of the unearned land grant of the Oregon Central Railroad Co.

Mr. Ingalls, of Kansas, presented a bill to authorize the construction of a bridge across the Mississippi at or near Sibley, Mo. Also a bill to grant right of way through the Indian Territory to the Southern Kansas Railway Co.

In the House on the 7th:

Mr. Rosecrans, of California, presented a bill to enable the Capital Cable Railway Co., of Washington to construct its road.

Mr. Sumner, of California, presented a bill to fix and establish the maximum rate of freight fares on the Union and Central Pacific railroads. [It provides that after 60 days from the passage of this act it shall be unlawful for those companies to charge a greater sum than 70 per cent. of the lowest rates of freight, or the lowest prices of carriage existing on Dec. 3, 1883.]

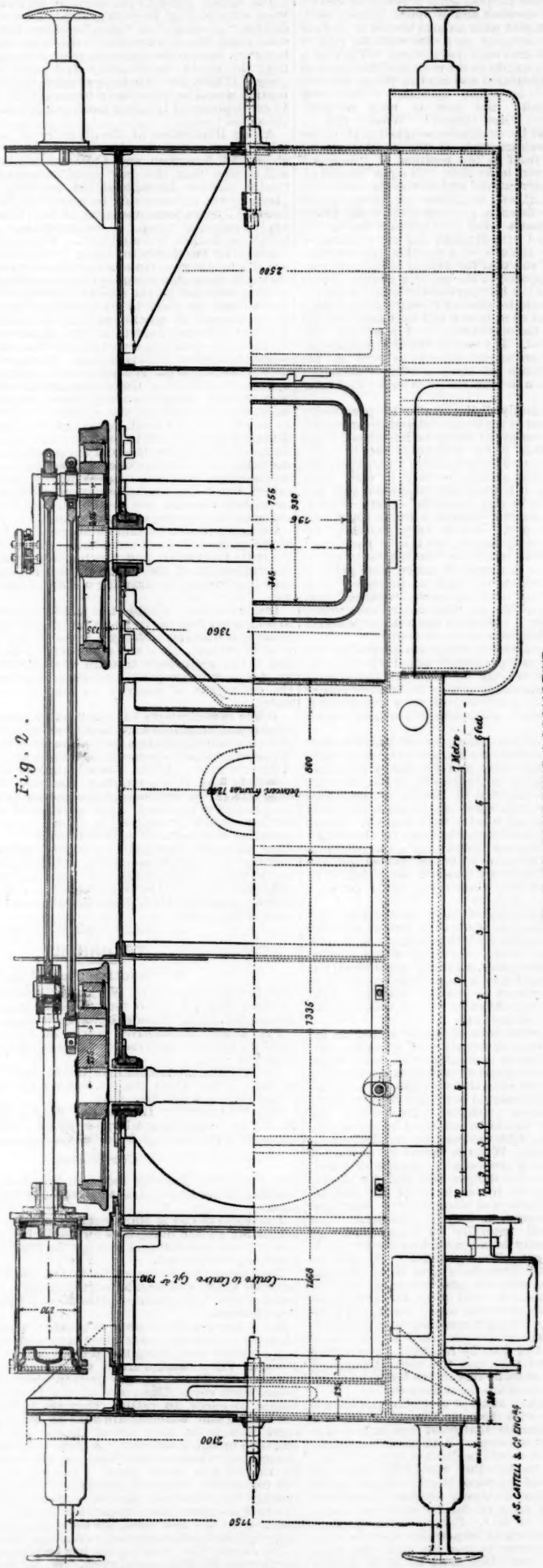


Fig. 2.

PLAN OF COMPOUND LOCOMOTIVE,

Built by F. Schichau, Elbing, Germany.

In the Senate on the 8th:

Mr. Van Wyck, of Nebraska, presented a preamble and resolution setting forth that it is asserted by the New Orleans Pacific Railroad Co. that, as the Attorney General has decided in favor of said company as to the lands claimed by them, and that the Secretary of the Interior has felt constrained to act upon said opinion, it be resolved that until Congress at this session determine the question involved in the claims of said company for lands, the Secretary of the Interior suspend action as to issuing certificates or patents for said lands.

In the House on the 8th:

Mr. Hunt introduced a joint resolution for the immediate appropriation of $1,000,000, in accordance with the urgent request of the Mississippi River Commission. Referred.

Mr. Bingham, from the Committee on Post Offices and Post Roads, reported back a resolution calling on the Secretary of the Interior to report to the House whether any railroad company which has been aided by the government has granted or attempted to grant to any other corporation or telegraph company any right to operate the lines of telegraph belonging to said railroad company, so as to prevent the company from performing its duty to the government and public. Adopted.

Mr. Beach introduced a bill to authorize the construction of a bridge across the Hudson River, between Storm King and Break Neck mountains, New York. [Mr. Beach states that his bill has no connection with that introduced in the New York Legislature by Senator Murphy.]

A message was received from the President, transmitting the report of the Mississippi River Commission, in which he says:

"I take this occasion to invite the early attention of Congress to the continuation of the work on the Mississippi River, which has been carried on under the plans of the Commission.

"My sense of the importance of the improvement of this river, not only to the people of the Northwest, but especially to the inhabitants of the lower Mississippi River Valley, has already been expressed in a special communication to the last Congress.

"The harvests of grain and cotton produced in the region bordering on the Mississippi are so vast as to be of national importance, and the project now being executed for their cheap transportation should be sufficiently provided for. The Commission report that the results due to the still uncompleted works have been remarkble, and give the highest encouragement for expecting the ultimate success of the improvement. The act of Aug. 2, 1882, appropriated $4,123,000 for the work on that part of the river below Cairo.

"The estimates of the Commission already transmitted to Congress call for $3,000,000 for the continuation of the work below Cairo, and it appears from their report that all of the last appropriation available for active operations has been exhausted, and that there is urgent need of an immediate appropriation of $1,000,000 to continue the work without loss of time, in view of the approach of the flood season, with its attendant dangers. It therefore recommends to Congress the early passage of a separate bill on this subject."

A message was also received from the President with respect to the construction of the Hennepin Canal. Accompanying the message are copies of the act of the General Assembly of the state of Illinois ceding to the United States the Illinois & Michigan Canal; of the record of the state officers of the vote upon the proposition to cede the canal at the state election succeeding the act of cession, and of the letter of the Chief of Engineers transmitting to the Secretary of War the report of the surveys for the proposed Hennepin Canal, authorized by the act of Augnst, 1882. In his message the President says: "I submit a communication from the Governor of the state of Illinois, with a copy of an act of the General Assembly of that state, tendering to the United States the cession of the Illinois & Michigan Canal, upon condition that it shall be enlarged and maintained as a national water-way for commercial purposes.

"The proposed cession is an element of the subject which Congress had under consideration in directing by the act of Aug. 2, 1882, the survey for a canal from a point on the Illinois River, at or near the town of Hennepin, by the most practicable route to the Mississippi River, at or above the city of Rock Island; the canal to be not less than 70 ft. wide at the water line, and not less than 7 ft. in depth of water, and with capacity for vessels of at least 280 tons burden; and, also, a survey of the Illinois & Michigan Canal, and an estimate of the cost of enlarging it to the dimensions of the proposed canal between Hennepin and the Mississippi River.

"The surveys ordered in the above act have been completed, and the report upon them is included in the last annual report of the Secretary of War, and a copy is herewith submitted.

"It appears from these papers that the estimated yield of corn, wheat and oats, for 1882, in the states of Illinois, Wisconsin, Iowa, Minnesota, Kansas and Nebraska was more than one thousand million bushels. It is claimed that if the cheap water transportation route, which is now continuous from the Atlantic Ocean to Chicago, is extended to the upper Mississippi by such a canal, a great benefit in the reduction of freight charges would result to the people of the upper Mississippi Valley, whose productions I have only partly noted, not only upon their own shipments, but upon the articles of commerce used by them, which are now taken from the Eastern states by water only as far as Chicago.

"As a matter of great interest, especially to the citizens of that part of the country, I commend the general subject to your consideration."

The letter of the Chief of Engineers to the Secretary of War is dated Nov. 27, 1883. In it he says: "The surveys demonstrated the perfect feasibility of the route for the Hennepin Canal." Three lines, he says, were surveyed, known respectively as the Marais d'Osier, the Watertown and the Rock Island route, and he submits the following estimates of the cost of each route:

"Marais d'Osier route—Construction of canal and feeder, including right of way, $5,811,367; maintenance and ordinary repairs, annually, $88,600.

"Watertown route—Construction of canal and feeder, including right of way, $7,207,646; maintenance and ordinary repairs, annually, $91,245.

"Rock Island route—Construction of canal and feeder, including right of way, $6,672,890; maintenance and ordinary repairs, annually, $94,820."

These estimates, he says, are based upon the following dimensions:

Canal—80 ft. wide at surface and 7 ft. deep, locks 170 ft. long and 30 ft. wide. The cost of enlarging the Illinois & Michigan Canal, so as to conform to these dimensions, he estimates at $2,198,919, and the cost annually of maintaining and keeping it in repair at $50,000. He thinks that no changes in the present line of this canal, or number or location of locks, will be necessary.

Train Signals.

[From the Third Edition, as revised and enlarged, of Marshall M. Kirkman's book, now in the hands of the printer, on "Train and Station Service."]

The dangers resulting from the diversity in the signals used by different railroad companies have been already alluded to. How to secure a general uniformity in such signals is a practical, and at the same time a very difficult problem.

In the consideration of this subject it should be remembered that the diversity referred to is not the result of mere caprice on the part of the persons by whom the signals in use were originated.

In the early history of railroads signals were practically

unknown*, and the men in charge of the lines, who had little or no experience in the business. Some had been steamboat or vessel men; some had been in the military service, and some had been connected with the fire departments of cities. So far as they had already had experience with signals of any kind they would naturally endeavor to make those to which they were already accustomed apply so far as possible to their new vocation. The traffic at first was light, and the number of signals actually needed very few. The different railroads were many of them widely separated, and opportunities for consultation between their officials few and seldom availed of. As experience in the practical details of the business and the growth of the traffic suggested the necessity for additional signals, they were invented and applied with little or no regard to the usages of other companies. Some of them were found to be poorly adapted for the purpose for which they were intended, but so long as no very serious results followed their use the difficulty of making a change, and the disinclination of the persons by whose authority they were introduced to acknowledge their failure, caused them to be retained. And so long as the railroads continued to be widely scattered and their traffic light, this diversity occasioned no serious difficulty or danger, but with the growth of business different systems of road are brought each day closer together, and lack of uniformity in this respect becomes a great and constant menace to the safety of individuals and the revenues of the companies. The hamlet that a few years ago was proud in the possession of a single railway outlet is now a prosperous city and the centre of a vast network of lines, each perhaps operating its trains by a widely differing code of signals. The trains of these roads in some cases are run for a greater or less distance upon the tracks and into the stations and yards of others, and the men in charge are frequently called upon to observe and act instantly upon signals different from those to which they are accustomed in the ordinary routine of their duties.

As an illustration of the diversity existing the following signals used by roads centering at Chicago are given:

LAMP SIGNALS.

"*Go ahead!*"	Roads.
Swing lantern over head	5
Raise and lower perpendicularly	3
Swing in a vertical arc	1
"*Stop!*"	
Raise and lower	3
Swing sideways, or across track	6
"*Back!*"	
Swing from right to left	2
Swing over head	1
Swing in a circle	1
Swing sideways	1
Raise and lower	3
Swing vertically in a circle	1

HAND SIGNALS (BY DAY).

"*Go ahead!*"	Roads.
Throw one or both hands from the breast outward	2
Swing hand over the head	2
Raise and lower the hand	1
"*Stop!*"	
Raise and lower the hand	3
Wave hand across the body below the head	1
Swing across the track	1
"*Back!*"	
Half circle over the head	2
Swing the hand sideways	1
Swing hand vertically in a circle	1
Hands extended widely and separately	1

WHISTLE SIGNALS.

"*Brakes on.*"	Roads.
One short blast	11
Two short blasts	2
"*Brakes off.*"	
Two short blasts	9
Two long blasts	2
One short blast	2
"*To recall flagman.*"	
Four short blasts	5
Four long blasts	1
Five short blasts	2
Six short blasts	2
"*Note flag on engine.*"	
Three short blasts	1
Four short blasts	1
Five short blasts	3
Six short blasts	1
Two short followed by one short blast	1
"*Train has parted.*"	
Five short blasts	0
One long, two short and one long blast	2
One long add short blast, six times	1
Same repeated several times	1
"*Approaching station.*"	
One long blast	3
One blast, two seconds	1
One blast, three seconds	1
One blast, five seconds	3
One blast, ten seconds	1
"*Highway crossing.*"	
Two short blasts	1
Two short and one long blast	2
One blast, three seconds	1
One long and one short blast	2
One long and two short blasts	3
Two long and two short blasts	1

[See *Travelers' Official Guide*, October, 1881.]

The danger arising from this wide diversity of signals is too evident and serious to require comment.

How, then, shall the evil be remedied?

It cannot be done by the laws of the different states, acting separately. Wherever that has been tried it has only served to aggravate the confusion.

It can hardly be done by taking the signal code in use upon any one of what are considered our best managed roads and adopting it as a standard. Even if it could be decided which was the best managed railroad (a thing manifestly impossible), it would probably be found that the rudiments of its signal code were an inheritance from the days of its infancy.

In considering this subject the great difficulty, and even danger temporarily, of making any change at all must not be forgotten.

While the purposes for which signals are required are many, the materials available for these purposes and which may be relied on under all the varied circumstances connected with the operation of trains, are comparatively few. They consist, chiefly, in the form and position of permanent structures erected at particular points, the color and position of stationary lamps or flags, and the color and movements of flags or lamps held in the hands, or the movements of the hands themselves; also strokes of the engine gong and sounds of the whistle.

A great variety is of course possible in the form and general appearance of permanent signaling apparatus, and devices almost innumerable have been introduced for the purpose. None of them, however, can easily and quickly be so radically changed in appearance as to be practically available for more than a very limited number of signals. As a general rule they are only used to indicate the position of particular switches or whether the line in front is clear or obstructed. For the latter purpose what is generally known as the semaphore is the simplest and is quite largely used. It consists of an upright post with an arm hinged at or near its top so that it may be dropped on a line with the post or raised at any angle to it that may be desired. The arm is most prominent at right angles to the post, and this position is therefore generally recognized and used as the proper one to indicate "danger" or "line blocked." The arm dropped on a line with the post is used to indicate "all right" or "line clear." When this is the case the arm should be so counterweighed that in the event of breakage or derangement of the machinery for working it will rise of itself to the position of "danger." Some authorities, however, insist that "all right" should always be given by a positive signal and not by the mere absence of the danger signal, and would use for that purpose a position of the arm sufficiently prominent to attract attention, but sufficiently distinct from that used for danger, so as not to be confounded with it under any circumstances. Some, again, advocate the use of a position intermediate between that for safety and that for danger to indicate caution, while others are opposed to the use of a caution signal at all. They say that if the line beyond the signal is not entirely clear no train should be allowed to enter upon it until is so, at least not without coming to a full stop and learning definitely the nature of the obstruction and receiving definite permission to proceed. The same general principles apply to the use of other permanent signals as well as the semaphore. This difference of opinion affords abundant opportunity for difference in practice such as we find actually existing.

The only objects sufficiently distinctive to be practically available for fixed signals at night are red and green lights. White and yellow lanterns might easily be mistaken for the ordinary station and other lights in general use near the tracks, and blue can only be distinguished at a very short distance. By day a somewhat greater variety in color may safely be allowed, but as it is generally recognized that the signals used by night and by day should be closely related, it is not generally attempted, though white is sometimes substituted for green by day. Red is very generally accepted as the color indicating danger, but it is so frequently used where merely possible danger or "caution" is intended as to impair its value as a signal of actual and positive danger. Green is also sometimes used to indicate "caution." Sometimes one red light indicates "caution" and two "danger;" a lamp outside the rails means one thing, between the rails another. In all these matters it is desirable that there should be definiteness and uniformity.

The number of flags or lanterns which can profitably and effectively be used for any particular signal is necessarily very limited, and they can only be displayed in the most definite and prominent positions, such as the front or rear of a train, or on the station platform, or at a considerable height above it; intermediate and indefinite positions cannot be relied upon.

The only movements of the hands, or of lamps or flags held therein, which are sufficiently distinct to be practically available under all circumstances and for use by all classes of employés are, up and down, across the track, over the head or in a circle. The number of strokes of the engine gong and blasts of the whistle which can be advantageously used for signaling purposes is also very limited, though some latitude is allowed in the latter instance by the ability to distinguish between long and short blasts, and combinations of each. Where reliance is to be placed on the difference between short and long blasts of the whistle it is, however, necessary that the distinction should be very plainly made.

To make the best possible use of these limited materials (and such use must certainly be made in a system intended for general adoption), requires an intimate practical knowledge of the needs and actual workings of the service. Even when the best possible code, all things considered, has been framed there will hardly be a single signal proposed to which some objection cannot be made. With many the great, and to them sufficient objection will be that it is not what they have been accustomed to.

One will say that the best system of signals should be the simplest; that for the sake of simplicity and consistency all the visible signals should have a similarity to each other. Thus he will suggest, that the generally recognized semaphore signal to stop being the arm extended at right angles to the post, the hand signal to stop should be by day the arm of the man held in a similar position. By night the same position of the arm should be indicated by repeatedly raising the lamp to a level with the shoulder and dropping it the full length of the arm. When a signal of caution is given by the semaphore it is generally by the arm at a position midway between that for danger and that for safety. The same signal can be given by the hand of the man by day, dropped from the position of danger for a short distance, repeating the operation as may be necessary. This motion slowly given will naturally be interpreted "go slow." The same thing may be indicated by a similar gentle motion of the lamp at night. The signal for "all right, go ahead" being given by the semaphore arm being dropped nearly or quite on a line with the post, the same may be given by the arm of the man dropped down, but moving on a level from side to side to make the order positive, a horizontal motion of the lamp by night meaning the same thing. The signal to back up is seldom if ever given by the semaphore. If desired, it could be done by raising the arm nearly perpendicularly above the post, and the natural sequence would be the band of the man by day or the lamp by night swung above the head to indicate the same order.

Another will disregard any attempt to harmonize the use of the permanent signals with those given by hand, but will adhere to the general principle that hand and lantern signals should be practically the same. Both should be simple as possible, and while each should be distinct from the other the transitions from one to the other should be easy and natural. Gentle motions of the hands should indicate gentle motions of trains, and thus swinging motions, horizontal and over the head, should be used for forward and back, both of course being easy at first. Perpendicular motions are more naturally energetic and imperative and also most distinct, and should therefore be used for stop, the most important order and the one which must be most quickly obeyed.

Another will urge that each signal should be the one best adapted for the particular purpose without reference to other signals, except not to conflict with them. Thus the signal to stop by night should be a light swung across the track, as being the most natural thing to do in case of danger and one that an outsider, knowing nothing of signals, would be most likely to adopt. It can be done forcibly without danger of putting out the light; it covers a wider range of vision than any other, and is therefore more likely to attract the attention of the engineer. For "go ahead" he will favor the lamp swung over the head as being easily seen; no danger of putting out the light, and the natural motion for all right. To back the motion up and down is plain, easily seen and can be made to give an idea of the distance required.

All these persons will agree generally as to the importance of uniformity, but they will not so readily agree as to what system is best.

The signals given to the engineer by strokes of the gong were adapted from those in general use upon steam vessels: one for "go ahead" or "stop" and two for "back," and on some roads this arrangement is still retained. It was found, however, that in the event the train should part when running the strain on the cord would cause one stroke of the gong. If then the train were stopped suddenly the detached portion would be quite likely to come into collision with it. In consequence of this fact many roads use two strokes as the signal to stop.

As an illustration of the diversity of whistle signals, a table is appended, showing the usages in this respect on about 200 American and Canadian roads. From this it will be seen that the only signal the use of which is practically uniform throughout the country, is the warning given by the engineer that he is about to back, three short blasts. Upon a large majority of the roads the signal to apply brakes, or "stop," is one short blast, while the signal to release brakes is two blasts. Still quite a number of roads prefer two blasts for "stop" and one for "let go," and are able to give good reasons for the preference. For instance, they will claim that it is more distinct and likely to attract attention, and that by the interval between the blasts an intimation can be given to the brakemen whether the train is to be stopped as quickly as possible or easily. The most noticeable diversity exists in the signals used as warnings for highway crossings, some twenty different combinations of sounds being used for this purpose. The signal most generally used is one long blast. It is also the one most generally used on approaching stations. Quite a number of roads use as a highway crossing signal two long blasts, followed by two short ones; but so free use of the whistle cannot but be annoying to people along the track, as well as to passengers. A great diversity is noticeable in the other signals. Many of them do not affect directly the safety of persons or property, their use being only a matter of convenience and a saving of time, and uniformity in such cases is not so important as in the others, but it is nevertheless desirable. It would, if nothing more, be a valuable aid in the matter of discipline and in reducing the running of trains to an exact science.

On many roads a certain number or combination of strokes of the gong or blasts of the whistle means one thing when the train is standing and another when running, and this principle may, if the circumstances be duly weighed, be used to advantage in framing a code of signals for general use.

In considering the subject of whistle signals it is necessary to remember that the frequent use of the whistle impairs its value as a warning of danger, which is of course by far the most important. It is also a nuisance both to the traveler and to the community through which the train passes, and its use is very properly prohibited or largely restricted by the ordinances of many cities and by the laws of some states.

While organizations of many other classes of railway officers and employés have been in existence for a long time it is only recently that an association has been formed among the superintendents in charge of the operaing departments of American roads. Quite naturally one of the first objects considered by this association was that of signals. The code thus far recommended for adoption by this association is embodied in this book. The question of signals received further careful consideration from a convention of representative railroad men held at Chicago in October, 1883. They adopted the signals previously agreed upon by the Association of Superintendents, adding such as seemed proper to them. These, with others, are also embodied herein, and, like those of the Superintendents' Association, harmonize generally with those contained in the previous editions of this book.

* At first a candle placed in the station window indicated that trains were to stop; the absence of a candle implied the reverse. Upon one line the use of the red lantern was restricted to the higher officers of the company, and was intended as a badge of their authority. The idea of using it as a signal had not then occurred to them. Appliances of every kind were exceedingly crude. Flagmen and switchmen were, in some instances, required to provide themselves with a flagstaff 8 ft. long, having a white flag 3 ft. square attached to one end of it, and a red flag of the same size to the other, while in other cases no flags at all were specified or provided.

TECHNICAL.

Locomotive Building.

The Brooks Locomotive Works in Dunkirk, N. Y., have received an order for 5 ten-wheel freight engines for the Burlington, Cedar Rapids & Northern road.

The Grant Locomotive Works in Paterson, N. J., are building some locomotives for a railroad in Colombia, South America.

The Pittsburgh Locomotive Works have taken an order to build 10 ten-wheel freight engines for the Burlington, Cedar Rapids & Northern road.

The Schenectady Locomotive Works in Schenectady, N. Y., are completing a large order for eight-wheel freight engines for the Chicago & Northwestern road.

Car Notes.

The Fitchburg Railroad shops in Charlestown, Mass., are building 12 passenger cars, 4 caboose and 50 box cars for the road.

The Buckeye Car & Manufacturing Co. in Columbus, O., is building a lot of dump cars for the United States Car Co., also 100 box and 100 coal cars for the Cincinnati, Washington & Baltimore road.

The Patten Car Works, at Bath, Me., which have been idle for some years, will soon be started up by a company composed of New York parties and the Messrs. Patten.—*National Car-Builder.*

Mr. Adams, at the Boston & Albany shops, at Allston, has a lot of passenger cars under way, and will go on building, probably completing the present order with from 15 to 18 cars. These coaches are of the regular standard pattern of the road. The shops are just turning out a lot of 30 palace stock cars. These are of the Lincoln pattern, intended to carry 16 cattle. They are 35 ft. in length, and the feeding and watering are done on the road. There are eight buckets on each side of the car, which, when not in use, turn up out of the way. A tank is located on the top of each car, which holds 125 gallons, a quantity sufficient to fill the buckets three times. There are two hay boxes on the top of the car, and openings closed by trap-doors, through which the hay can be thrown down to the cattle. The cars are mounted on suspension trucks. The shops, in addition to the new work, are keeping up the repairs both on freight and passenger cars.—*National Car-Builder.*

The Janney Car Coupling Co. has been organized in Pittsburgh with $50,000 capital stock. W. M. McConway, Geo. Roldings, W. P. Seibert and G. J. Kebbeck, of Pittsburgh, and H. C. Bushbays, of Chicago, are the stockholders.

The Wason Manufacturing Co., at Brightwood (Springfield), Mass., is building a number of passenger and baggage cars for the Panama Railroad. The passenger cars are constructed peculiarly. As wood quickly decays in that climate the sides of the cars are so constructed as to contain as little wood as possible, the windows being separated simply by the sash. The windows, in turn, contain no

glass, on account of the heat, and are consequently covered simply with blinds.

The Lima Car Works, at Lima, O., are building a number of freight cars for the Michigan & Ohio road. Mr. George B. F. Cooper has recently been appointed Superintendent of these works.

Bridge Notes.

The Detroit Bridge & Iron Works in Detroit, Mich., are building a double-track iron viaduct over Kettle Creek near St. Thomas, Ont., on the Canada Southern Division of the Michigan Central. The new viaduct takes the place of the old single-track wooden trestle, and is nearly 200 ft. high. One track is finished and in use, and work is in progress on the second.

Alden & Lassig, of Chicago and Rochester, N. Y., have in hand a double-track iron bridge 540 ft. long, in four spans for the Chicago & Northwestern road at Geneva, Ill., and a double-track iron bridge over Rock River, near Rock Island, Ill., for the Chicago, Rock Island & Pacific road. This bridge will have eight spans of 160 ft. each.

Iron Notes.

The St. Louis *Age of Steel* reports that a scheme, originating among the furnace men of the Lehigh Valley, is on foot to pool the entire pig iron industry of the United States. "The plan is to divide the country into six districts, each to be represented in the pool on a basis made up from the tonnage-producing capacity of the district, and the profit-earning capacity per ton as shown by the work of a series of years. Each furnace in a district is to share in the district's share of the general pool on a basis determined in the same way. One of the chief objects of the scheme is to ascertain the exact product of pig iron in the country, and with this information in the hands of the Executive Committee having the authority to shut down it can be ordered at any time to let the demand catch up with the supply, and prices can thus be made regular and steady. It is also proposed that at any time when the furnaces are ordered to be stopped for any reason each will draw its share of profits from the pool as though it were in blast."

Pittsburgh iron men ridicule this statement, and say that such a combination would be entirely impracticable, and that it is not worthy of serious consideration.

The Phœnix Iron Co. at Phœnixville, Pa., is filling an order for steel deck beams to be used in the new war ships to be built for the United States at Roach's ship-yards. The company is making arrangements to put up a new train of rolls to make steel beams up to 15 in. in depth.

The rolling mill of the Hollidaysburg Iron and Nail Co., at Hollidaysburg, Pa., has been shut down for want of orders.

The Vulcan Steel Works at Carondelet, Mo., closed Jan. 1, and it is uncertain when work will be resumed.

The blast furnace of the Steubenville Furnace Co. at Steubenville, O., was sold by the trustee Jan. 2, and bought for $20,200 for account of the bondholders. The bonded and floating debt was about $55,000 in all.

The works of the Pennsylvania Steel Co. at Steelton, Pa., made the usual stop of a week over the holidays for general repairs.

The Republic Iron Works in Pittsburgh, which have been closed for repairs, have started up again with a number of orders on hand.

The George P. Whitaker Iron Co. is building a forge at Principio Furnace in Cecil County Md., in which pig iron produced by the furnace will be worked up into blooms. The forge will have 12 fires with a Bennett steam hammer, and will have a capacity of 60 tons of blooms a week. Principio Furnace was first built in 1721, and has been operated almost continuously since that date. Mr. George P. Whitaker bought an interest in the furnace in 1834, and has been sole owner since 1855.

Manufacturing Notes.

The copartnership heretofore existing between Max Nathan and Isidore Dreyfus was dissolved Dec. 31, by mutual consent, either of the partners signing in liquidation. The business heretofore conducted by the firm will be continued by a corporation known as the Nathan Manufacturing Co., which is organized with the following officers: President, Max Nathan; Vice-President, Wm. Toothe; Secretary and Treasurer, Jacob W. Mack; Assistant Secretary, Charles Judge. The office continues at Nos. 92 and 94 Liberty street, New York.

The town of Moline, Ill., is just about to start its new water works. The pumping machinery, having a capacity of 1,500,000 gallons in 24 hours, was supplied by the Deane Steam Pump Co., of Holyoke, Mass. It consists of one compound condensing pump for the lower part of the town, and a smaller compound pump for that part known as the Cliffs.

Messrs. Andrews & Clooney, manufacturers of car springs at No. 545 West Thirty-third street, New York, announce that from Jan. 1 Messrs. F. T. Lerned and W. L. Garey have an interest in the business, Mr. Lerned filling the position of General Agent.

The Automatic Truck Works at Midland Park, N. J., are filling orders for their trucks from the New York, Ontario & Western and the Wabash, St. Louis & Pacific roads.

The Rail Market.

Steel Rails.—The *Iron Age* says: "We hear of numerous transactions having occurred within the past two weeks. Sales have been made by Pennsylvania mills at $37 to $37.50, delivered at Boston, and at $35, delivered at Perth Amboy. One Eastern company reports sales amounting to 38,000 tons, on private terms, made last week. It is rumored that the recent sales by Pennsylvania companies at $35, delivered at Chicago, have caused the net price ($32.20 at mill) to be named in some home contracts. The era of low prices, however, seems to be over for the present, and those purchasers who secured the bottom figures are fortunate, as the companies which have recently been sharply competing for business have secured all the orders they care to take, some of them having almost the full capacity of their mills engaged for the coming year. The Cambria Iron Co. now refuse orders below $36 at mill and Messrs. Carnegie Bros. & Co. ask $36.50. At Eastern mills small lots for quick delivery might be placed at $34, but for later deliveries $35 is said to be the lowest rate named. The rail manufacturers now regard themselves masters of the situation and confidently look forward to higher prices as the season advances."

Rail Fastenings.—Spikes are unchanged at $2.50 to $2.60 per 100 lbs. in Pittsburgh, and track bolts at $2.75 to $3.10. Splice bars are quoted at 1.75 to 1.85 cents per pound.

Old Rails.—Sales are reported of old iron tees at $21.50 per ton at tidewater for foreign and $22 to $22.50 for American.

New Form of Barbed Wire Fence.

A new form of barbed-wire fence consists in an arrangement of stellate or wheel barbs within loops of the fence wires, the wheel barbs being mounted horizontally on a couple of pointed wires, each having one end looped for interlocking with each other and passed through or around the opposite strands of the loops of the fence wires, the straight or perpendicular and interlocked barbs forming the axis on which the wheel barbs freely rotate.—*Iron Age.*

Fast Time on the Canada-Atlantic.

A correspondent of the *Scientific American* gives the following particulars as to the speed of the fast trains on the Canada-Atlantic Railway. If the figures are correct they are probably the fastest trains in the world, but it is somewhat difficult to believe that 11 miles can be run in 11 minutes from start to stop, and, indeed the time-table, as given in the *Rand-McNally Guide*, gives the time as 18 minutes instead of 11, which somewhat alters the merit of the performance. Possibly the distance between South Indian and Eastmans is traversed in 11 minutes, both stations being passed at full speed without slackening. A speed of 60 miles an hour on the level is rarely attained by even the fastest English express trains.

"Maxville to Ottawa 43.09 miles, time 50 minutes, equal to 53 miles per hour. Alexandria to Eastmans 44.04 miles, time 50 minutes, equal to 53.02 miles per hour. South Indian to Eastmans 11 miles, time 11 minutes, or 60 miles per hour.

"The entire run from Coteau to Ottawa, 78.04 miles, with three stops, one of which is for taking water, gives a record of 54½ miles per hour, allowing 6 minutes for the stops.

"The official report of this train, for a full calendar month, gives 27 trips in consecutive order, 1:34.5/7 minutes average time on a schedule of of 1.34. When it is borne in mind that railway superintendents do not permit of running ahead of time the regularity of this train's arrival is worthy of note."

Uneven Action of Car Springs.

It has been noticed by car builders that, from some cause not very apparent, the bodies of passenger cars do not always have a satisfactory motion on the trucks, although the springs are furnished and have been carefully tested by the best makers. The cause of the trouble has in one instance, at least, been traced to the fact that the equalizing springs and the elliptics in the same car, having been furnished by different makers, had been tested as to their required capacity by different testing apparatus, the result being a lack of harmony in the concurrent action of the two sets of springs. The difficulty was remedied by the makers of the elliptics furnishing a set of spirals that were tested by the same machine or tester that the elliptics were, thus causing the two sets to work harmoniously. We do not suppose that, as a general thing, there is such a difference as is here indicated in the testing appliances used by different spring manufacturers. Equalizing and bolster springs are often furnished by different makers for the same cars, with no apparently inharmonious action to affect the easy riding of them.—*National Car-Builder.*

The Iron and Steel Industry in 1883.

Mr. James M. Swank, Secretary of the American Iron & Steel Association, who is extraordinarily well informed as to the condition of this business, writes as follows in the last *Bulletin* of the Association:

"The iron and steel industries of this country sympathized fully in 1883 with the general tendency to dullness. Production was not, it is true, much less than in the preceding year, but prices were not satisfactory, and the constant doubt that existed concerning the course the market might take was almost as great a source of anxiety and discontent as low prices. Roundly stated, and dealing only with average quotations, the shrinkage in the prices of leading iron and steel products during the year was as follows: No. 1 anthracite foundry pig iron at tidewater fell from $25 in January to $21 in December; gray forge pig iron at tidewater from $21 to $18; Bessemer pig iron at Pittsburgh from $24.50 to $21; gray forge pig iron, all lake ore, at Pittsburgh, from $22 to $19; steel rails in Pennsylvania from $40 to $35; (iron rails were virtually forced out of the market during the whole year by the low prices of steel rails;) bar iron at Pittsburgh fell from 2.25 cents per pound in January to 1.85 cents in December; nails in the same market fell from $3.40 to $2.40. It will be seen that the decline has been very serious—much more serious than is generally supposed. It would seem that prices cannot go any lower than they now are, and this theory would appear to be sustained by the fact that the owners of furnaces and rolling mills and steel works on every hand have put out their fires because the future offered no hope of their realizing living profits.

"We are able to estimate very closely the production of pig iron in 1883. On the 1st of July we ascertained definitely that the production for the first six months of the year was 2,352,019 gross tons, or just 40,357 tons *more* than the one-half of the production of 1882. This rate of production was not, however, maintained during the latter half of the year, although it was not greatly reduced, as we ascertained definitely on the 1st of November that the number of furnaces then in blast was only three less than on the 1st of July. We think it to be a safe supposition that the production of 1883 was equal to that of 1882, but that it did not exceed it. The production of 1882 was 4,623,323 gross tons.

"We are also able to estimate closely the consumption of pig iron in 1883. We commenced the year with 383,655 gross tons of domestic pig iron unsold. This quantity was increased to 528,590 tons on the 1st of July, but by the 1st of November there had been a decrease to 432,354 tons. At the close of the year it is exceedingly probable that stocks had been reduced to the figures which prevailed at the close of 1882, namely, 383,655 tons. We imported during 1883 about 325,000 tons, all of which may be said to have gone directly into consumption. Adding the estimated production, 4,623,323 gross tons, to the estimated importation, 325,000 tons, and taking no account of the balanced stocks at the beginning and end of the year, we have 4,948,323 tons as the approximate consumption of the year. By similar methods, but dealing in all cases with ascertained facts, we estimated in our last annual report that the consumption of pig iron in 1882 was 4,963,278 gross tons.

"The production of steel rails in 1883 has fallen below that of 1882, and we also made in 1883 probably 100,000 tons less iron rails than in 1882. The total rail tonnage of 1882 was 1,507,851 gross tons, of which 203,459 tons were iron rails and 1,304,392 tons were steel rails. The total rail production of 1883 was probably 1,300,000 gross tons, of which about 1,200,000 tons were steel rails and 100,000 tons were iron rails. Our imports of rails in 1883, mainly of steel, aggregated about 100,000 gross tons, against 200,000 tons in 1882. In round numbers our consumption of rails in 1883 was 300,000 tons less than in 1882."

THE SCRAP HEAP.

Flat Wheels.

When Mr. P. was General Manager of the A., B. & C. Railroad, he had a private secretary whom we will call Smith. Now Smith was a faithful and energetic secretary, yet there were many practical details of railroading with which he was unacquainted. Mr. P. was summoned to meet the directors at Boston. Before leaving he talked over affairs with Smith, telling him to attend to the General Manager's correspondence during his absence, and authorizing him to sign his name. In case any serious question arose he was was to telegraph Mr. P. before acting upon it. Among the attachés of the general office was a harum-scarum, fun-loving fellow by the name of Jones, and Jones saw his opportunity in Mr. P.'s absence. He took conductors and station agents into his confidence, and soon the General Manager's office was flooded with complaints about flat wheels. If a train was delayed the conductor reported that it was owing to flat wheels on the cars of his train. If cars were held at a station the agent reported that they could not be moved because of flat wheels. For all sorts of mishaps the same excuse was given—flat wheels.

Smith was sorely troubled. The season of heavy freight traffic had arrived and every car on the road was needed, and here was a difficulty he had never before encountered. He did not wish to expose his ignorance and ask Mr. P. for instructions, yet the complaints continued to pour in. At a loss what to do, he finally appealed to Jones, who happened into his office one day. He showed Jones the numerous complaints, and confessed that he was all at sea in the matter. Jones explained to him that when cars remained standing on the track the tendency was to cause a flat place in the tread of the wheel where it rested upon the rail, and as there had been a dull season that was the cause of so many flat wheels. "But how shall we remedy the matter?" says Smith. "The only safety lies in keeping the cars continually in motion," replies Jones. So Smith issued a general order over the signature of the General Manager instructing station agents that under no circumstances was a car to be left in one place more than 12 hours, and that if no engine could be had to move the cars they must be moved by pinch-bars, so as to prevent the flattening of the wheels. Freight engineers were instructed to move their trains slightly while waiting upon a siding, and passenger trains were to make their stops as brief as possible, that the danger of flat wheels might be avoided.

When Mr. P. returned from Boston and found this general order with his name at the bottom of it, he—didn't say much, but called them all in. It is said that he paid as high as ten dollars apiece for some of them.

A Trap to Catch Passes.

We are in receipt of inquiries from various railway officials for information as to the above company, owing to applications from the "Massachusetts & New Hampshire R. R. Stb't. Co," for annual and trip passes, and the fact that their time-tables do not appear in the *Guide*. It is proper we should say here that we have refused at any price to insert the company's advertisement, when tendered for the months of December, January, and February, because it seemed to us that the object was based upon the fact that at the end of the year the exchange annuals issued by companies to each other's proper officials are applied for and sent, and was, therefore, too apparent.

We are informed that the company is chartered under Massachusetts laws with the title of "Massachusetts & New Hampshire *River Rafting* Stbt. Co." The abbreviation of *River Rafting* to "R. R." is a matter of taste; but whether it is *good* taste to do that which captious persons might think was intended to mislead, is for others to say. "R. R." by custom stands for Railroad; and we cannot learn that this company owns or operates a mile of road, nor does their annual report appear with others of the Massachusetts Railroad Commissioners, or in "Poor's Manual."—*Pathfinder Railroad Guide, Boston.*

A Train-Wrecker Arrested.

A dispatch from Lynchburg, Va., Jan. 3, says: "Detective John Wren and his men have arrested the man who derailed the eastern-bound passenger train on the Norfolk & Western Railroad, half a mile this side of Bristol, on the morning of Nov. 23, when by the merest good luck the entire train escaped wreckage and the passengers death. The miscreant proves to be Andrew Wade, a negro ex-brakeman, who was dismissed from the company's service for insubordination and neglect of duty. Wade had quarreled with the switchman at the point where the train was derailed, and partly out of spite against the company and partly from a desire to have the switchman removed, he broke the switch open and threw the train off the track. Since that time he has made several other attempts to wreck trains, but without effect. He is now in jail at Goodson, awaiting indictment by the grand jury of Washington County. Wade numbers the third train-wrecker arrested by Wren and his men within the past week."

Abolishing the Pay Car.

The Indiana, Bloomington & Western Co., at the beginning of the year, abolished the office of Paymaster and the running of a pay-car over the road. The duties of paying off fall upon Auditor Dickson, who will adopt the new plan of paying men off by sending drafts to the agents, who in turn will pay employés.

Rebuilding the "Arabian."

The "Arabian," an engine belonging to the Baltimore & Ohio Railroad Co., which has gained considerable celebrity during the past few years, having been exhibited at expositions in various parts of the country, and which was greatly damaged when the Pittsburgh Exposition building was burned, a few months ago, has been rebuilt at the Mount Clare shops in this city, and in a few days will be again placed in service as a shifting engine in the yard. The "Arabian" has something of a history. It was built at Mount Clare in 1834 and was one of 12 machines under the superintendence of Mr. Eneas Davis, the designer, who was afterward killed by it. For a considerable time the "Arabian" was used to haul passenger trains between Baltimore and Harper's Ferry, and it frequently attained a speed of 15 miles an hour, a high rate of speed for that period. After a while, however, the demands of modern railway travel compelled the "Arabian" and others of its class to give place to more powerful engines, and for 30 years past it has been in operation shifting in the Mount Clare yards, except when sent to other cities to be placed on exhibition.—*Baltimore Day.*

Ice-Bound.

The imaginative gentlemen who stated in a morning paper yesterday that certain sections of the New York Central trestle were washed away from the foot of Virginia and Jersey streets, and lodged against the Bird Island pier, would be interested in visiting the scene and observing the exact nature of the damage. Instead of being washed away the double-track trestle of the New York Central, where that road crosses the lake between Georgia street and Porter avenue, has a firmer road-bed and a securer ballast than it ever had before. For the entire distance, except a few rods toward the northern end, from tracks to lake level is a solid mass of ice. Not only that, but the storm literally buried the trestle in ice; and, although it crosses the arm of the lake at a grade about 12 or 15 ft. above the water level, this space was filled in and made solid ice, and at the southern end a great winrow of frozen breakers is reared like a wall between the tracks and the lake. If the curious observer climbs this precarious eminence, he gains a view well worth the seeing. From the shore out to mid-channel, Niagara River is an Arctic field. Looking lake-ward the tower of the outer lighthouse is seen to be en-

crusted with ice several feet thick. Yesterday afternoon the structure glowed in the sunlight like a tower of molten glass.

Division Superintendent Burrows, of the Central, had a large force of men at work yesterday, under his personal supervision, on these ice-swamped trestles and in the adjacent yard. Tracks had to be laid bare with pickaxes, and in order to thaw out switches steam and hot water were let upon them from locomotives. The trestles are not considered as weakened in any way. Trains for Lockport, Niagara Falls, and for the Canada roads by way of International Bridge, left the city yesterday by the lakeside line, using the east track of the trestle. By night both tracks had been excavated, and will probably be in use to-day. No Belt Line trains are yet run except between Exchange street and William street, for the accommodation of Rochester & Pittsburgh passengers; but it was stated last evening that the usual service would be resumed to day.

One of the most striking things to be seen along the lake front in the vicinity of the Central's trestle is a long train of cars that stand on a siding next the open lake. They were hauled out there when the breakers began to run high, three days ago, in order to protect from ice the adjoining tracks. Some of these cars are empty and others loaded with lumber. There are perhaps a quarter of a mile of the cars. From one end to the other they are a solid wall of ice. Most of the cars cannot be seen at all. On the lake side the ice is two and three feet thick. The spaces between the cars are filled solidily with ice, while the space between the wheels under the entire length of the train is a miniature Mammoth Cave; a gallery of stalactites and stalagmites. Several of the cars have crushed and caved beneath the weight of the ice. It is a veritable train of ice, and remains like adamant under the present temperature.—*Buffalo (N. Y.) Express, Jan.* 6.

On the Edge of a Precipice.

Near Willsboro, Essex County, N. Y., on the New York & Canada Railroad, is a tunnel cut through solid rock, and at the northern extremity a perpendicular cliff rises on the west side, while on the east side is a precipice looking down upon the deep waters of Lake Champlain, more than one hundred feet below. The track runs within three feet of the edge of the precipice. The train leaving Troy at 8:35 a. m. is due at Willsboro at 2 p. m. Track-walkers patrol the road at this point day and night. On Saturday, Dec. 29, a big tree, loosened by a high wind, fell from the rocky heights above, and became so lodged that one end was firmly wedged against the rocks. The track-walker saw the obstruction, and as the train due in New York at 7:35 p. m. is scheduled to pass Willsboro before the up train, he started northward to flag it. But the down train happened to be late, and the train bound north was directed to proceed on his time. The engineer did not notice the obstruction until well out of the tunnel, and before he could slacken speed the engine struck the fallen tree and crashed through it. The engineer sustained a terrible shock, and was dazed for a few minutes. The locomotive was only slightly damaged. Had the train been derailed and gone into the lake not a soul would have escaped. The trunk of the tree where the engine struck it was 18 in. thick.

Military Railroad Men.

A correspondent of the Boston *Herald* writes to that paper as follows:

"I would like to inquire if there is at this time any class of men who served the Government during the war who have not made themselves conspicuous by reunions or organizations excepting the military railroad men? As one of that class, I think that my experience and that of others entitles all such to make it known to the people of the United States that the part performed by them was of as much consequence as that of those who did the fighting. What would the armies have done without railroads and railroad men? Could General Sherman have made his march to Atlanta, and from there to Savannah, without the railroads? Possibly, but how would the time occupied in doing it compare with the time in which it was accomplished? Was he not entirely dependent on the railroad men to keep his army moving? The danger of being killed, wounded or captured was as great as to those of any other branch of the service. Now the railroad men should take this matter into consideration, and, if we can start up a little enthusiasm it may lead to the desired end—that of organization. I think we can hold a convention that will make as good a showing as any military organization in the country. The telegraph operators who were identical with us, and in numbers smaller, have organized and held a convention at Chicago. In consequence they are in a fair way to have their services considered. Let the railroad men step to the front and show themselves. I'll guarantee that's all the people will ask."

24 O'Clock.

Mr. B. W. Wrenn, General Passenger Agent of the Western & Atlantic road, recently issued the following circular:

"It has been suggested that the confusing manner of expressing time by 'A. M.' and 'P. M.' be discontinued, and that time be reckoned from midnight to noon, as 1 to 12 o'clock, and afternoon by adding to 12, thus: Our present 1 o'clock P. M. would be '13 o'clock,' omitting P. M. As the suggestion seems to be receiving much favor with the press and public, we will demonstrate its working with the five daily passenger trains now leaving the city by this line.

TRAINS LEAVE UNION DEPOT, ATLANTA, AT

(7:30 A. M.)
7:30 For all points north, east and west via Dalton or Chattanooga (also to Rome).
(2:35 P. M.)
14:38 For all points north, east and west, via Dalton and Chattanooga (also to Rome).
(4:05 P. M.)
16:05 For Rome and all way stations.
(4:55 P. M.)
16:55 For Marietta and all way stations.
(11:40 P. M.)
23:40 For all points north, east and west, via Dalton or Chattanooga.

"Parlor cars leave at 7:30 for Nashville without change. Pullman cars leave at 14:35 for Louisville and Cincinnati, also for Washington, without change. Pullman hotel cars leave 23:40 for Cincinnati and Nashville without change."

Swindling the Pennsylvania Railroad.

A dispatch from Philadelphia, Jan. 4, says: "What is believed to be the beginning of the exposure of an extensive swindling scheme among the passenger conductors and palace-car conductors employed by the Pennsylvania Railroad was brought to light to-day at a hearing before a magistrate. The company some time ago received information that it was being systematically robbed by the conductors. An investigation was instituted and information was discovered which warranted the arrest of the conductors. General Passenger Agent Wood had warrants issued for the arrest of a number of the conductors. On the arrival of the trains at the Broad street station the palace car conductors were taken into custody. The men were A. J. Rogers, a resident of Allegheny, Pa., and conductor of the train running from Washington to Philadelphia; L. Rollins, living at Jersey City, who was conductor of the train from Jersey City to Philadelphia, and William B. Pettit, conductor of the train that runs from this city to New York. The manner in which the robbery was carried on was very simple. The palace-car conductors would collect the tickets before the regular train conductors came through. It was the duty of the former conductors to hand the tickets to the train conductors and have them punched. This they failed to do, and consequently the tickets were not mutilated. When the trains arrived at their destination the conductors, instead of turning their tickets over to the company, pocketed and disposed of them at prices below their value. It is alleged that the dishonest conductors were in collusion with ticket scalpers in New York.

"The accused men were arraigned before Magistrate Smith this morning. General Passenger Agent Wood testified to the above-stated facts. Rogers was placed under $1,000 bail to answer. Rollins was held in similar bail to await a requisition from the Governor of New Jersey, as his offence was committed in that state, and Pettit was held for a further hearing to-morrow. As none of the defendants were able to furnish the necessary security, they were committed to prison."

Pools.

Fessenden, the ninny, thought the Pool of Bethesda must have been a railway pool, because the account speaks of the many cripples waiting to enter it.—*Boston Transcript.*

The Pullman Car Co. have 13,000 blankets. If you don't believe this, give the porter 50 cents on a cold night and he will show you one.—*Philadelphia Call.*

Never interrupt a woman when she is scolding. A broken rail has often been known to wreck a train; and, if you break her rail, it will certainly interrupt her train of thought.—*Oil City Blizzard.*

At stations on Russian railroads there is a grievance book, in which the traveller may inscribe his wrongs in any language, and which is periodically read by the authorities. That wouldn't work in this country. The railroads couldn't stand the expense for stationery.—*Boston Post.*

The only occasion upon which railway trains in the United States are known to attain a speed of 85 miles an hour is when you sweep in sight of a station, with your overcoat only half on, and see the train you want just starting out. Before you can reach the platform a shot from a Parrott gun couldn't catch that train. She may jolt along at 12 miles all the rest of the day; but for about one minute, as you go charging down the platform, she makes an easy hundred.—*Burlington Hawkeye.*

A Railroad Semi-Centennial.

The Pennsylvania Railroad will celebrate the semi-centennial of the running of its first train April 16. The Governor, the Canal Commissioners, members of the Legislature and other dignitaries went from Harrisburg to Columbia by canal, April 15, 1834, and the next day were carried by rail to Philadelphia, to the admiration of the whole country. The celebration will be held at the city first named.

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the current volume of the *Railroad Gazette:*

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Missouri Pacific.

The following statement for the year ending Dec. 31 last is issued by this company:

"Inasmuch as considerable time will elapse before the annual report will be ready, the directors of the company have authorized the following preliminary statement for the year 1883 of the business of the company. December is partly estimated, but the actual results will but slightly vary from the following:

Gross earnings Missouri Pacific and Iron Mountain roads	$17,107,441
Operating expenses, 53.8 per cent. (including $607,648 for betterments and construction)	9,205,100
Net earnings	$7,902,341
Dividends, interest, etc., received	449,283
Total estimated net receipts	$8,351,624
Interest, rentals and other charges	4,137,861
Total net profit	$4,213,763

"This net profit is more than 14 per cent. on $30,000,000 capital stock, representing 1,895 miles of railway, about $16,000 per mile."

The gross earnings as given above are $9,208 and the net earnings $4,170 per mile of road. As compared with 1882 (when the two roads were reported separately), there was an increase in gross earnings of $627,169, or 3.8 per cent., an increase in expenses of $787,833, or 9.4 per cent., and a resulting decrease in net earnings of $160,664, or 2.3 per cent. The average mileage for 1882 was 1,669 miles.

Richmond & Danville.

This company owned and worked the following lines during the year ending Sept. 30 last:

	Miles.
Richmond & Danville, owned, main line	140.5
" " " branches	12.2
Piedmont road, owned	48.5
Total Richmond & Danville Division	201.2
Northwestern North Carolina, owned	25.2
North Carolina R. R., leased	223.1
Atlanta & Charlotte Air Line, leased	209.0
Richmond, York River & Chesapeake, leased	38.0
Total	756.5

The company also controls and operates the Milton & Sutherlin road, 6.8 miles, and the State University road in North Carolina, 10.5 miles, reporting them separately.

In addition to the above the company controls through the ownership of a majority ($7,510,000) of the stock of the Richmond & West Point Terminal Railway & Warehouse Co., the Virginia Midland, the Western North Carolina, the Charlotte, Columbia & Augusta, the Columbia & Greenville and their dependencies. The company also controls, through the lease of the Atlanta & Charlotte Air Line, 70 miles of narrow-gauge branches which are operated independently.

The equipment consists of 123 locomotives; 52 passenger, 12 combination, 10 postal and 22 baggage and express cars; 1,595 box, 30 stock, 678 flat and gondola, 26 coal and 63 caboose cars; 3 officers' and 2 pay cars, and 38 service cars.

The general account, condensed, is as follows:

Stock		$5,000,000.00
Bonds		6,715,150.00
Bills and accounts payable		1,383,520.47
Accrued interest, etc		289,991.33
Profit and loss		996,791.20
Total		$14,385,453.00
Road and property	$6,885,698.09	
Betterments to leased lines	648,546 83	
Stocks and bonds owned	6,048,018.13	
Supplies on hand	383,586.62	
Accounts and balances	261,138.85	
Cash	158,464.48	
		14,385,453.00

The funded debt consists of $3,000 old second-mortgage bonds; $1,228,100 consolidated mortgage bonds; $3,698,000 general mortgage bonds, and $3,969,000 debenture bonds, which are given in the accounts at the issue price, 45, making $1,786,050.

The traffic for the year was as follows:

Train miles:	1882-83.	1881-82.	Inc. or Dec.	P. c.
Passenger	939,211	1,158,881	D. 219,670	18.9
Freight and mixed	1,585,340	1,475,346	I. 109,994	7.5
Service	682,044	633,556	I. 48,488	7.6
Total	3,206,595	3,267,783	D. 61,188	1.9
Pass.-train car miles	4,771,590	.....	.....	...
Freight car miles	23,719,688	.....	.....	...
Passengers carried	597,213	587,980	I. 9,233	1.6
Passenger-miles	20,965,067	34,738,058	D. 3,772,991	10.8
Tons freight carried	756,498	704,176	I. 52,322	7.4
Ton-miles	123,514,249	119,126,853	I. 6,386,396	5.4
Av. train load:				
Passengers, No	33	30	I. 3	10.0
Freight, tons	79	81	D. 2	2.5

In 1881-82 there was a heavy passenger travel to the Cotton Exposition at Atlanta. Last year there was some diversion of through travel to the Virginia Midland road.

The earnings for the year were as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Freight	$2,591,182	$2,318,122	I. $273,060	11.8
Passage	909,564	965,937	D. 56,373	5.8
Mail and express	220,965	253,203	D. 32,238	12.7
Miscellaneous	84,081	113,811	D. 29,730	26.1
Total	$3,805,792	$3,651,073	I. $154,719	4.3
Expenses	2,218,854	2,353,038	D. 134,184	5.7
Net earnings	$1,586,938	$1,298,035	I. $288,903	22.3
Gross earn per mile	5,031	4.908	I. 123	2.5
Net " "	2,098	1,745	I. 353	20.2
Per cent. of expenses	58.30	64.40	D. 6.10	...

The earnings of the Richmond & Danville proper were $1,554,042 (7,724 per mile); the expenses $745,491, and the net earnings $808,551 ($4,018 per mile).

The results from the controlled and operated lines were as follows:

	Earnings.	Net Earnings.	Rental.	Sur. or Def.
N. W. N. Carolina	$67,796	$39,137	$39,137	.....
N. Carolina	860,111	243,538	260,000	D. $16,462
Rich. York R. & Ches.	240,827	98,537	85,850	S. 12,687
At. & Char. Air Line	1,074,016	397,175	466,500	D. 69,325
Milton & Suth	6,781	*1,921	.....	D. 1,921
State University	6,559	258	.....	S. 258

* Deficit.

The interest paid on the Northwestern North Carolina bonds outstanding is $780; the balance of its net earnings is credited to interest on bonds held by the Richmond and Danville Co.

During the year 10,265 tons of steel rails were used in renewals. About 70 per cent. of the main line from Richmond to Atlanta is now laid with steel. Much ballasting was done and many minor improvements made.

The result of the year was as follows:

Net earnings for the year	$1,586,937.82
Received from interest on investments, not including $38,353 61 received for interest on Northwestern N. C. Railroad bonds held by this company	18,319.10
Total net revenue for the year	$1,605,256.92
Amount total interest on funded and floating debt of Richmond & Danville Co., including interest on debentures and rentals of leased lines for the year	1,492,700.74
Balance, net revenue over all charges	$112,556.18

President Buford's report says: "As seen in the statement above the entire net revenue of the company for the year, over all interest and rentals, was $112,556.18, the interest so debited including one year's interest on the debentures, as well as all other obligations of the company. The annual interest on the debentures outstanding amounts to $238,140, to which add the above balance of $112,556.18, and we have an aggregate of $350,696.18. The amounts expended for the year in new property were: For the Richmond & Danville, $226,901.86; in betterments of the Atlanta & Charlotte Air-Line, $246,139.13; and in betterments of the Richmond, York River & Chesapeake, $4,863.58—making an aggregate expended for new property during the year of $477,904.57, or $239,764.57 more than the full interest for one year on the debentures. These expenditures being regarded as judicious, and, indeed, necessary in the best interests of the company, and authorized under the terms of the debentures, the reason is apparent controlling the management in their determination to declare no dividend at present applicable to the debenture coupons matured and maturing, relying on increased net revenues from economical administration, and more favorable opportunities for the conversion of some of the company's reserved assets to meet any possible accumulation of debenture coupons.

"It is the purpose of the present management to confine themselves to the use of all proper resources to develop the properties now controlled by the company, increase their revenues, economize their administration, and provide with the utmost punctuality required by the company's obligations, for all demands upon it. This they regard as alike their duty as its managers and their interest as its owners.

CONNECTED ROADS AND PROPERTIES.

"The connected roads of your system, comprising prominently the Virginia Midland, the Western North Carolina, the Charlotte, Columbia & Augusta, the Columbia & Greenville, the Spartanburg & Union, and the Georgia Pacific, have received such measure of constant and active attention on the part of your board as the interests of this company therein have required.

"The Georgia Pacific Railway has been fully completed and equipped, and is now in successful operation from Atlanta to Birmingham, 167 miles, and thence 10 miles to Coalburg, in the midst of the developed coal properties of the Black Warrior field—a district of unlimited wealth in minerals. This road is rapidly developing a varied and increasing traffic, and already opens to your principal lines several additional and valuable connections with the southwest not hitherto enjoyed.

"The Western, or Columbus Division, has also been completed and put into operation from Columbus, Miss., to the developed mines in the westerly portion of the same coal measures.

"The work of construction and improvement on the Western North Carolina road has been continued in such

manner as the situation seemed to require and justify. Its traffic has increased over 55 per cent. during the year, and its importance and future value as a property and as a part of your system is coming to be duly recognized.

"Under arrangements effected through the Richmond & West Point Terminal Railway & Warehouse Co. the completion of the Richmond & Mecklenburg Railroad, from Keysville, on the Richmond & Danville road, to Clarksville, Va., 31 miles, has been finally secured. Only a few miles now under work remain to be finished. Its opening business promises well for the section of country accommodated by it, and indicates a good prospective value as a branch connection of your main line."

RETROSPECTIVE.

The report of the General Manager, Col. T. M. R. Talcott, says: "In view of my retirement from the position of General Manager at an early day, after nearly 15 years continuous service on the Richmond & Danville Railroad and its leased lines, for about 13 of which I have been in charge of its transportation service as well as the maintenance of its property, I deem it not inappropriate to make an exhibit of the results which have been attained, from year to year, in the operation and maintenance of the several properties owned or controlled by the company for the above period.

"The period between the close of the war and Sept. 30, 1868, was devoted chiefly to repairing the damages which the property of the company had sustained during and at the close of the war. For the next three years—from Oct. 1, 1868, to Sept. 30, 1871—the Richmond & Danville and Piedmont railroads were operated as a merely local line between Richmond and Greensboro', with revenues but little more than sufficient to meet current operating expenses and renew 17⅛ miles of the 168.3 miles of old rails in the main line and branches, which had been in use an average of about 11½ years prior to Oct. 1, 1868, at which date the only really good rails in the track were those put in during the years 1866, 1867 and 1868, amounting to 23⅜ miles, nearly all of which were used to replace the old stringer track.

"The lease of the North Carolina Railroad, in September, 1871, inaugurated an era of development, increasing the length of roads operated by the company to 419½ miles, and the completion of the Northwestern North Carolina Railroad in 1873 further increased it to 446 miles, after which no addition to the mileage was made until April 1, 1881, except about 3½ miles of extensions to branches.

"The opening of the Virginia Midland Railway to Danville, in May, 1873, brought a competitor into the field at that point, but the completion of the Atlanta & Charlotte Air-Line Railway in September, 1873, made new and important additions to the traffic, both passenger and freight, and the control of the Charlotte, Columbia & Augusta Railroad, acquired in September, 1878, added still further to the business of the company, until for the year ending Sept. 30, 1880, a surplus of $232,546 was earned after paying all expenses, interest and rentals, including $118,500 for improvements made during that year.

"The control of the Atlanta & Charlotte Air-Line Railway was acquired on April 1, and of the Richmond, York River & Chesapeake Railroad July 1, 1881, increasing the mileage of roads operated by the Richmond & Danville Railroad Company to 763.6, to which there was added Feb. 1, 1882, the State University Railroad, of North Carolina (10.5 miles), which was completed at that date, and the Milton & Sutherlin road (6.8 miles), leased from July 1, 1882, making the aggregate for the past fiscal year 774 miles.

"For the last three years, from Oct. 1, 1880, to Sept. 30, 1883, the earnings from transportation have exceeded the expenses of maintenance and operation $3,972,594, while the interest and rentals of all the roads operated by the company amounted to $3,650,690, leaving a surplus applicable to improvements of $321,904, exclusive of interest on investments and receipts from other sources, which swelled it to $946,031. During this same period there was expended in improvements on and new equipment for the Richmond & Danville and Piedmont railroads, and charged to cost of road and property, $1,006,664, or $60,633 more than the surplus revenue of the company, as above; and in addition thereto, betterments were put upon the Atlanta & Charlotte Air Line and the Richmond, York River & Chesapeake, which cost $729,898, a total expenditure of $1,736,562 in three years for improvements."

Philadelphia & Reading.

This company's statement of earnings and expenses for the fiscal year ending Nov. 30 last is made public this week, and the figures are given below. The President's report, with the balance sheet and other portions of the report, will not be made public until the annual meeting next week. The statements given include the operations of the Central Railroad of New Jersey from the date of the lease, June 1, 1883, that is, for one-half the last year.

The earnings of the Railroad Co. for the year were as follows:

	1883.	1882.	Inc. or Dec.
Earnings	$29,797,930	$21,890,117	I. $7,907,813
Expenses	15,250,450	12,031,052	I. 3,219,398
Net earnings	$14,547,480	$9,859,065	I. $4,688,415
Gross earnings per mile.	23,280	22,000	I 1,280
Net "	11,365	9,909	I. 1,456
Per cent. of expenses	51.18	54.96	D. 3.78

A large part of the increase both in gross and net earnings came from the Central Railroad lines, as shown below. The addition of the Central lines also aided both in increasing the earnings per mile and lowering the proportion of expenses, although a considerable gain in both respects was made last year without this help.

The earnings of the Railroad Co. for the year were divided between the Reading and the New Jersey Central lines as follows:

	Reading—year.	Central—6 mos.	Total.
Earnings	$23,006,759	$6,791,171	$29,797,930
Expenses	11,989,940	3,260,510	15,250,450
Net earnings	$11,016,819	$3,530,661	$14,547,480
Central rental, 6 mos		2,897,178	2,897,178
Surplus over Central rental		$633,483	$11,650,302

This shows for the Reading lines, as compared with the previous year, an increase of $1,116,642, or 5.1 per cent., in gross earnings; a decrease of $41,112, or 0.3 per cent., in expenses, and an increase of $1,157,754, or 11.7 per cent., in net earnings. The Reading expenses were 52.11 per cent. of gross earnings, and the Central were 48.01 per cent—a very low proportion for a road having its traffic.

The earnings and expenses of the Coal & Iron Co. for the year were as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Earnings	$17,038,859	$15,470,044	I. $1,628,815	10.6
Expenses	16,117,087	14,209,870	I. 1,907,217	13.4
Net earnings	$921,772	$1,200,174	D $278,402	23.2
Per cent of exps.	94.59	92.21	2.38	....

The increase in coal mined directly by the Coal & Iron Company was 11.4 per cent., and the decrease in coal mined on its lines by tenants was 1.4 per cent, so that the gain in gross earnings does not indicate any considerable change in prices received for coal. The expenses show a large increase, however, and the net earnings were considerably short of the interest requirements.

The total earnings of both companies for the year were as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Earnings	$46,836,789	$37,300,161	I. $9,536,628	25.6
Expenses	31,567,538	26,240,922	I. 5,126,616	19.2
Net earnings	$15,469,251	$11,059,239	I. $4,410,012	39.9
Per cent. of exps	66.97	70.35	D. 3.38	....

Here again it must be kept in mind that $6,791,171 of the gross increase and $3,530,661 of the net increase came from the addition of the New Jersey Central lines.

The income statment is as follows:

Total net income, both companies		$15,469,251
Debit balance of renewal fund	$27,499	
State tax on capital stock	55,909	
All rentals and full interest on funded and floating debt of Railroad Co.	12,101,667	
Interest on all obligations of Coal & Iron Co. other than those held by Railroad Co.	1,126,943	
		$13,312,081
Surplus for the year		$2,157,233

The amount required to pay 7 per cent. on the preferred stock is $108,626, and 6 per cent. on the common stock is $1,990,973, a total of $2,099,599, so that the surplus is sufficient to pay these dividends and leave a balance of $57,634 for the deferred income bonds.

The interest paid for the Coal & Iron Co. was $205,171 more than the net earnings of that company for the year.

The traffic statement for the year was as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Passengers carried	18,195,264	12,027,470	I. 6,167,794	51.3
Tons merchandise	8,416,788	7,490,382	I. 926,406	12.4
Tons coal	11,449,373	8,429,826	I. 3,019,547	35.8
Tons coal on colliers.	531,403	574,931	D. 43,528	7.6
Tons coal mined:				
By Coal & Iron Co	4,582,667	4,111,830	I. 470,837	11.4
By tenants	1,491,465	1,512,959	D. 21,494	1.4
Total	6,074,132	5,624,789	I. 449,343	8.0

Assuming that all the coal mined from the Coal & Iron Co.'s lands passed over the railroad—as probably very nearly all of it did—that coal formed 53 per cent. of the total tonnage of the railroad for the year.

The traffic of the New Jersey Central lines for the six months of the lease is given as 5,398,335 passengers, 1,574,457 tons merchandise, and 2,857,497 tons of coal. Deducting this from the total for 1883, as given above, we have the tota traffic of the Reading lines proper given as 12,796,929 passengers, 6,842,331 tons merchandise, and 8,591,876 tons coal. This shows for the Reading lines an increase of 769,449, or 6.4 per cent., in the number of passengers carried; a decrease in merchandise tonnage of 648,051 tons, or 8.7 per cent., and an increase in coal carried of 162,050 tons, or 1.9 per cent. The company does not report passengers or ton-mileage, but the average haul on passengers and freight over the Central lines probably does not differ greatly from that over the Reading.

New York, New Haven & Hartford.

This company owns a line from Williamsbridge, N. Y., to Springfield, Mass., 123.2 miles, with branches from Berlin, Conn., to New Britain, 3 miles; from Berlin to Middletown, 10 miles; in Hartford, 1 mile; from Windsor Locks, Conn., to Suffield, 4.5 miles. It leases the Harlem River & Portchester road, from New Rochelle, N. Y., to Harlem River, 11.8 miles; the Shore Line road, from New Haven, Conn., to New London, 50 miles, and (from Oct. 1, 1882) the Boston & New York Air Line, from New Haven to Willimantic, 50 miles, making 141.7 miles owned and 253.5 miles worked. The trains run over the New York & Harlem road from Williamsbridge to the Grand Central Depot in New York, 11 miles. The report is for the year ending Sept. 30.

The equipment consists of 122 locomotives; 288 passenger and 87 mail and baggage cars; 2,417 freight cars. This is an increase during the year of 17 engines, 60 passenger, 5 baggage and 264 freight cars, which includes 7 engines, 7 passenger, 4 baggage and 152 freight cars received with the leased Boston & New York Air Line.

The general account is as follows:

Stock		$15,500 000.00
Bonds		2,000.000.00
Bills and accounts payable		566,323.08
Contingent account		236,989.18
Profit and loss		2,213,146.28
Total		$20,516,458.54
Road and property	$16,454,428.74	
Advances to Harlem River & Port. Co	17,009.84	
Sinking fund	1,184,257.55	
Supplies	572,883.35	
Due from agents and connecting roads	328,360.80	
Loans, stocks and bills receivable	983,210.00	
Cash	976,308.26	
		$20,516,458.54

The bonds are 4 per cent. 20-year bonds issued June 1, 1883. The company is also responsible as endorser on $3,000,000 Harlem River & Portchester bonds, on which the yearly interest is $170,000.

The traffic for the year was as follows:

Train-miles:	1882-83.	1881-82.	Inc. or Dec.	P.C.
Passenger	2,277,552	2,017,635	I. 259,917	12.4
Freight	1,409 036	1,559,308	D. 150,332	9.4
Other	810,142	120,208	I. 689,934	....
Total	4,496,730	3,697,211	I. 799,519	21.6
Passengers carried	7,079,168	6,397,385	I. 681,783	10.7
Passenger miles	196,380,629	185,261,407	I. 11,119,222	6.0
Tons freight carried	2,160,023	1,908,322	I. 251,701	13.2
Ton-miles	131,051,708	117,459,321	I. 13,592,387	11.6
Av. train load:				
Passengers, No	86	92	D. 6	6.5
Freight, tons	93	75	I. 18	24.0

There was evidently a change in the manner of reporting train mileage. The traffic last year was on 253½ miles of road, as compared with 203½ miles in the preceding year. The average passenger journey last year was 27.74 miles; the average freight haul, 60.67 miles.

The earnings for the year were as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Passengers	$3,749,473	$3,393,514	I. $355,959	10.5
Freight	2,501 623	2,065,856	I. 435,767	21.1
Mails, etc	399,453	397,260	I. 2,193	0.5
Rents	78,825	81,178	D. 2,353	2.9
Total	$6,729,374	$5,937,808	I. $791,566	13.3
Expenses	4,705,346	3,968,120	I. 737,226	18.6
Net earnings	$2,024,028	$1,969,688	I. $54,340	2.7
Gross earn. per mile	26,546	29,178	D. 2,632	9.0
Net " "	7,984	9,679	D. 1,695	17.5
Per cent. of expenses	69.92	66.83	I. 3.09	....

Included in expenses are taxes amounting to $296,260, and rentals of stations and grounds amounting to $172,997 last year. The decrease in earnings per mile was due to the additional mileage, on which earnings are light.

The result of the year from the operations of the road was as follows:

Net earnings as above		$2,024,028.13
Rental, Shore Line R. R.	$100,000.00	
" Boston & N. Y. Air Line	150,354.16	
Interest, Harlem River & Port. bonds	170,000.00	
Interest on bonds accrued, not yet due.	20,485.71	
		440,839.89
Balance, surplus for the year		$1,583,188.26

From this surplus the usual 10 per cent. dividends were paid, amounting to $1,550,000, and leaving a balance of $33,188.26 for the year.

The earnings over the Harlem tracks, which are paid to that company as rental, are not included above, either in earnings or expenses; they amounted to $306,889 last year, against $291,504 in the preceding year.

The Treasurer's balance sheet for the year is as follows:

Balance cash assets, Oct. 1, 1882		$1,759,565.33
Materials on hand " "		347,502.41
Income for the year		6,729,374.41
First mortgage bonds sold		2,000,000.00
Premiums on " "		47,971.09
Total		$10,884.713.24
Total expenses, including rents, taxes and interest	$5,125,700.44	
Dividends, (2 of 5 per cent. each)	1,550,000.00	
Sinking fund	47,971.09	
Materials on hand, Oct. 1. 1883	572,883.35	
Construction account	97,774.17	
Equipment "	259,871.64	
Real estate "	305,000.00	
New construction (4 tracks)	58,780.84	
Decrease in accounts payable	561,842.81	
Due from agents	189,692.21	
" connecting roads	138,668.59	
Advances to Harlem River & Port.	17,009.84	
Stock and other securities of the H. & C. V. R. R. and C. V. R. R.	939,450.00	
Stock of Harlem River & Portchester	42,160.00	
Stock of New York Transfer Co	1,600 00	
Cash on hand	976,308.26	
		$10,884,713.24

The report says: "The percentage of increase in miles run is somewhat greater than in passengers or tons carried. This is owing to the fact that we are adding to the facilities afforded our patrons faster than they are adding to our business. This fact also explains why the gross receipts are less in proportion than the increase either of miles run, or of passengers and tons carried, and why the proportionate increase in expenses is materially larger than it is in the gross receipts.

"The mileage and gross receipts of the Air Line Division (as well as of the Shore Line Division), for this year, are included in the above statement. This needs to be taken into account in making these comparisons with the corresponding item in the report for the year ending Sept. 30, 1882, as we were not running the Air Line at that time.

"The Air Line has not been, for the past year, a source of profit to our company. Considerable money has been expended in getting it into good repair; several hundred tons of new steel rails have been laid; and in some other respects the expenses have been extraordinary. It is reasonably believed that the coming year will show better results.

"We have built and put into service during the past year about 50 new passenger cars of the Wheeler style, and have now in the shops, and nearly ready for service, 25 more. These will make, with the 25 built in 1881, 100 of that style in use on our road. These cars are, as we think, unsurpassed in neatness and comfort by any ordinary cars to be found on any road in this or any other country. They have cost something more than the cars in common use before they were built do, but their superiority over others for our service we think fully justifies the increase in cost. Some of them have been finished as drawing-room cars, and as such are very favorably regarded by the public. A part of the cost of these cars is, in this report, carried to account of new equipment. Several new engines made outside our own shops are carried to same account.

"The depot at Fairfield having been burned a new brick one (the old one was of wood) was erected in its stead in the fall and winter of 1882.

"About 500 ft. of the east end of the Cos Cob bridge, being of wood and requiring rebuilding, has been replaced with an iron structure similar to that at the West end. It is believed we have at that place a first-class bridge in every respect, equal to any load at any speed with entire safety. A part of the cost of this work has been carried to construction account.

"A new and substantial stone and iron bridge has been built at Saltonstall Lake, and also another across Niantic River, at East Lyme, on Shore Line Division.

"Of the $5,000,000 your Board was authorized, in May last, to borrow on the credit of the company, $2,000,000 have been already borrowed, and 4 per cent. bonds for that amount, with 20 years to run from June 1, 1883, and secured by a mortgage on your main line, have been issued therefor. These bonds were so disposed of as to yield a premium of $47,971.09. This sum, being in the nature of a profit on the sale of said bonds, it has been considered eminently proper, should be so disposed of that it may help to pay off said bonds when they mature. It has accordingly been placed in the sinking fund.

"A part of the $2,000,000 borrowed, to wit: about $512,000, have been used to pay off a balance of the indebtedness of this company incurred by the purchase of the securities of the Hartford & Connecticut Valley Railroad Co. About $300,000 have been applied in payment for new passenger cars, new engines, new bridges, etc., charged in this report to equipment and construction. About $350,000 have been used in paying for additional lands at Harlem River, New Haven, Wallingford and elsewhere.

"About $60,000 have been expended for additional rights of way, etc., in carrying forward the improvements of the road suggested in the report of last year. The balance is still on hand, to be expended in the further prosecution of said improvements, and is included in the Treasurer's cash balance as reported for the year. These improvements have not progressed as rapidly as was anticipated, for the reason that the acquisition of the necessary additional lands has been, unavoidably on our part, attended with a good deal of delay. It is hoped, however, that before the close of the year 1884 we shall have some additional track laid and in service.

"The item of damages paid during the current year is larger than usual, for the reason that this company has paid one-third of the damages growing out of the accident in the tunnel near 88th street in New York city. The employés, through whose omission of duty it is claimed this accident occurred, were, it is also claimed, joint employés of the three railroads using the tracks through the tunnel. We assumed this proportion of these damages provisionally, in order to expedite the settlement of the claims, though we are not without hope that we may yet be relieved from this payment, or at least some part of it."

RAILROAD GAZETTE

Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

UNIFORMITY IN CODES OF RULES.

The prompt and business-like manner in which the October time conventions adopted and put into effect Mr. Allen's carefully matured plan for universal time, and the confidence, resulting from this success, with which we may look forward to equally happy results in the matter of uniform train signals, which is now in the hands of a committee, open up an infinite range of possibilities in the way of greater uniformity in the numerous departments of railroad working which come under the immediate control of the superintendents. As was lately said, one of the most important steps necessary, and in some cases probably the only important one, seems to be to secure the proper arrangement and elucidation of the subject on which action is desired, so that its consideration need not engross an undue share of the time of the members of the convention, all of whose minds are burdened with matters of more immediately pressing importance.

The list of signals is so intimately connected with the whole code of rules that any consideration of them at once suggests the desirability of uniformity in the other departments usually included in a code, and it may not be unprofitable at this time to examine some of the points connected with this question.

No argument is needed to show that the present condition of this department of railroad management is that of complete confusion. Many codes lack the element of consistency in themselves, and most of them may be characterized as mere aggregations of orders issued at various times, by all sorts of men, and under widely varying circumstances. Hardly any two are alike, though the chief principles underlying the art treated of are the same in Maine as in California. The present success in the management of the operating department of railroads is due to the executive ability of the officers and to skill and faithfulness in the lower grades, not to the perfection of the system under which the operations are performed. Indeed, some of the most important roads in the country are conducted with very little system, so far as the ordinary employés are concerned; the active managing officer has a strong mind, keeping the affairs well arranged in his own head, and controls the actions of those below him largely by the force of his own individuality. Of course we speak here only of the departments that are usually included in the code of rules which is given to the train and station men, etc., for their guidance. Why this crude and apparently careless state of things exists it is perhaps needless to discuss here; there are various reasons well known to those most interested, a chief one being the fact that superintendents are always preoccupied with very knotty problems, which are of a degree of importance paramount, apparently at least, to all mere administrative questions. And the fact that the present way is very clear and simple *to him* tends to render an officer satisfied to "let well enough alone."

The present tendency, however, is unquestionably toward more system and less dependence on personal or one-man power. This is natural, resulting from the rapid expansion of the business and the consequent multiplication of details rendering intimate personal management increasingly difficult. The more distance there is between manager and worker the more need there is of system and discipline; hence the growing importance of an effective set of rules, which is, or should be, the foundation of orderly management. A very small defect in the foundation is often the cause of endless trouble in the superstructure.

The first side of this problem to be considered by a superintendent is the question what departments shall be covered by the code, there being a constant temptation to include all kinds of duties of various classes of employés, although the original plan contemplates, in most instances, only those engaged in caring for the track and trains, and such station employés as perform duties intimately connected with these. Rules referring to the checking of baggage, which belong to the general passenger department, and to the collection of freight bills, which should come from the general freight agent or auditor, and others of this nature, are therefore among the first things to be weeded out.

Having decided whom to address, one of the most necessary improvements on the prevailing custom will be found to be the arrangement of the rules for each class of men by themselves, so that they can be more readily referred to. Although codes always have rules for conductors, enginemen, station agents, track-repairers and others, they invariably have the topics concerning these different departments scattered all along through the work, from the first page to the last, so that each person, in order to learn what is required of him, must distract his mind from its main object by searching among the rules intended for others, or in studying chapters from which the duties devolving upon various employés must be deduced by more or less elaborate mental processes. To arrange each man's rules so that he can find them at a glance *seems* like unnecessary work, as it involves a good deal of repetition, it being often necessary to say the same thing to several different classes, but it is only seemingly so; repetition is not confusion, and, as viewed by the employé, there is great advantage in simplicity. In any given class of operatives, freight conductors, for instance, there is a much greater variety of mental ability than would at first thought seem to be possible; and a simple and important, though often forgotten, rule in addressing persons of widely varying capacities is, to put the thought in such shape that it may be readily comprehended by the very dullest person who is likely to be in need of it. When we assume that a certain person or a certain class understands a given principle or knows the meaning of a certain word we are treading on unsafe ground. The only infallible rule is to seek the utmost simplicity in everything that is said. One reason, doubtless, why simpler language is not oftener used is a feeling, frequently an unconscious one, that simplicity is too much like childishness, and so is likely to induce in the better informed employés a feeling of contempt for the rules, and thus impair their usefulness. This is not, however, a real objection; it is universally recognized that the very best specimens of lucid English are those that come from minds which are acknowledged to be the most highly educated. This is a matter in which extremes meet, the very highest and the very simplest minds using a common idiom, and that the plainest, leaving it for other classes between these two to invent complicated and foggy puzzles in words. A uniform style of language is absolutely indispensable if it is expected to produce the right impression on those who read the rules. We remember seeing not long ago, a code (of an important road) wherein some of the most important rules concerning train movements, etc., were expressed in language which may be characterized as mild and polite, while those regarding comparatively unimportant routine duties were laid down in such vigorous, even harsh, terms as to show at once that their writer held views as to what is and what is not strong language entirely different from those of the one who wrote the first-mentioned rules. This, of course, conveys to the inexperienced reader an entirely erroneous idea of the relative importance of the several rules.

Simplicity requires that only one thing be said at a time. Yet hardly a code can be found that does not show several, often many, instances of two or more subjects, naturally distinct, consolidated into a single sentence; and nearly always this seems to have resulted from the simple circumstance that the compiler was hurried and felt constrained to take the shortest cut out of his task. It is needless to say that this is not the way to construct rules which are intended to stand for years and to serve as models for the guidance of thousands of individuals. This point is intimately related to that of directness, by which we mean that quality in language which produces a distinct impression in the mind of the reader or hearer that the ideas expressed are aimed at *him*, individually, and which excludes, as far as possible, the idea that an indefinite number of other people are to share in the responsibility of heeding and executing the precepts given. One of the weakest points unquestionably in nearly every code is the variable and aimless character of the language used. It is not said that sharp language makes a sharp employé, or that an incisive tone in the manager will convert a dull person into a bright one; the subject of obedience to orders is not what we are discussing; but the point is that the clearer the rule the sooner will the employé have a precise and distinct understanding of what is wanted of him, and the better will be his mental grasp of the code as a whole.

Where all the operating employés are experienced and have perfected their knowledge by the aid of tradition and comparison, as was formerly the case everywhere and as it largely is still, these advantages are not so apparent, but, as we have intimated, the growing tendency to dependence upon what a man says he knows instead of upon the fact that he has proved himself possessed of certain talents, and the spread of competitive examinations such as seme roads employ in the selection of trainmen, make it increasingly important that the literary element, so to speak, be carefully considered as being a material factor in the problem of finding out exactly what kind of men one's employés are, and of enabling the men themselves to have a clear conception of what they do know and what they do not.

The plan of addressing each employé by himself, and in language aimed directly at him, is quite well shown in the series of articles on "Train Rules," which was published in the *Railroad Gazette* last summer. These articles also suggest, in that they throw aside a good many topics which are often regarded as necessary parts of a complete code, the inquiry whether or not the scope of most codes ought not to be considerably narrowed. This is a delicate and complex question, and one of those which most needs to be illuminated by discussion. Though not attempting to enlarge upon it here we suggest the query whether every code ought not to be divided into an inflexible and an elastic department. Without doubt many rules of secondary consequence, by being placed in the wrong position, becloud those which are of higher importance; and much might be said in favor of a code which should include only such points as are of positive importance, leaving those which are less stringent, and those in which it is desirable to appeal more or less to the employé's judgment, to be placed in foot notes or in separate chapters.

Doubtless the differing circumstances of different roads make necessary some differences in the rules by which their working should be governed. But there is a great body of regulations which are intended to effect the same thing in nearly the same way on all roads; at least these could be arranged in a simple, orderly, systematic and unmistakably clear code of general application, while the special rules required by special circumstances could be added to this standard code.

Space forbids our dwelling upon this subject further at this time, though in closing we would remind the reader that the advantages which would result from a standard code are not all on the side of the employé, by any means. Superintendents who already have a good system would, indeed, be conferring more immediate benefit upon their less careful brethren than upon themselves in perfecting a uniform code, but it should not in any sense be regarded as a wholly unselfish work.

The principal roads are constantly drawing more or less upon the smaller ones for officers and employés of all grades, and such men will be much more efficient when they can be set to work under a system with which they are already familiar than when they have so many new things to learn and so many old habits to unlearn as is the case now. An obvious advantage, too, of a code that is widely known is the focalizing upon it of the criticism of the best minds in the country, thus insuring the elimination, by discussion, of the weak or faulty features, and the gradual perfection, by the survival of the fittest, of a code which shall be the exponent of the combined wisdom of the ablest managers in the country.

INCREASED CAPACITY OF FREIGHT CARS.

The majority of the speakers at the recent discussion on this subject at the Car-Builders' Club seemed in favor of retaining the present capacity of box cars and increasing the capacity of coal and flat cars, as will be seen from the report of the meeting in our last issue. This view has much to commend itself. It is obvious that the capacity of a freight car must be first and foremost proportioned to the lading it is likely to receive. It is not only difficult to load 40,000 or 50,000 lbs. weight of many articles of merchandise in one car, but it often happens that a day's consignments between two stations do not reach anything like that weight, and, therefore, a car must leave partly loaded, or be loaded with goods for two or more different destinations, necessitating transferring at some point. The rougher kinds of freight, however, are generally consigned in large lots, and there should be no difficulty in getting a full load for a coal or flat car of large capacity, especially as the classes of freight, of which coal, iron ore, pig iron, etc., are examples, occupy but a small bulk for their weight.

Owing to the nature of the traffic these cars have very generally to return empty, but as this would happen whether the cars are large or small, the car of greater capacity would have a positive advantage in this respect, provided that, as usual, the increased size was attended with some reduction in the proportion of dead weight to the paying load conveyed. Assuming a case where a locomotive can draw a maximum train weighing 1,440,000 lbs., which is composed of 30 cars each, weighing empty 18,000 lbs., and carrying, say, 30,000 lbs. of coal, the net weight of coal conveyed would 30 × 30,000 lbs. = 900,000 lbs. If cars of 50,000 lbs. capacity, weighing only 22,000 lbs., be substituted, the same total weight, 1,440,000 lbs., would be attained by a train of only twenty cars, which could therefore be hauled by the same engine. The net weight of coal hauled, however, would be 20 × 50,000 lbs. = 1,000,000 lbs., or 11 per cent. more than with the smaller cars. In hauling the cars back empty the thirty cars will weigh 30 × 18,000 lbs. = 540,000 lbs., while the other train would weigh 20 × 22,000 lbs. = 440,000 lbs. Thus while on the one hand, the earning capacity of the loaded train is increased 11 per cent., the dead weight of the returning empty train is diminished some 19 per cent. The logical conclusion seems to be that the larger cars would not only permit of larger earnings, but effect some economy in haulage and track repairs. The economy in car repairs effected by a reduction of 50 per cent. in the number of parts, wheels, axle boxes, draw gears, etc., is obvious.

It is only reasonable to suppose that an increase in the capacity of coal cars will not be wholly effected by increasing their length. There is no reason that we are aware of why the centre of gravity of a loaded coal car should be considerably nearer the rails than that of a loaded box car. If a car can run safely when piled up to the roof with oats or any other bulky load, why should not a suitable car run with the same weight of coal piled five feet high on the floor, instead of, as usual, with a layer of only half that depth?

It is inconvenient and dangerous to human life to materially increase the width of freight cars, and any large increase of length is attended with more than a proportional increase of dead weight, owing to the stronger trussing and sills necessary to sustain the increased load on the longer span. It does, however, seem possible to increase the height of the sides of a coal car in such a manner that double the load can be carried by the same length of car, if advantage be taken of the higher sides to introduce a continuous top girth and form a stiff truss to support the greater load and keep the car from sagging.

The widespread application of continuous brakes to freight trains seems probable in the near future, and the adoption of large cars will probably facilitate and hasten this movement. The expense of a continuous brake is the chief barrier to its adoption, but as the cost varies little with the size of the car it is cheaper to fit it to 1,000 cars of 50,000 lbs. capacity than to 1,700 cars of 30,000 lbs. capacity, though the smaller number of large cars will probably convey more traffic and earn more money.

The universal adoption of large cars is likely, however, to have a somewhat serious effect upon some of the older bridges in the country, especially those of great length and span. The weight per foot run of a long train of loaded cars is fast approaching that of a train of locomotives. An average American type locomotive may be taken as weighing 130,000 lbs. with its tender, and covering about 55 ft. in length over all. These figures give a load of 2,363 lbs. per foot forward; or in other words, any bridge covered with a train of such locomotives would be loaded to the extent of 2,363 lbs. for every foot of its length, and few long bridges are tested with a much heavier load.

Some of the latest and largest box cars, those for the New York, West Shore & Buffalo road, for example, weigh 24,900 lbs. empty, and are marked to carry 50,000 lbs. When loaded to this extent they weigh nearly 75,000 lbs., and as they measure less than 37 ft. in length their weight per foot run is slightly over 2,000 lbs. The weight on any individual wheel would probably be under that on the drivers of a moderately heavy locomotive, but as a heavy load (37,450 lbs.) is concentrated on a truck having a wheel-base of only some 5 ft., it would probably produce nearly as severe local strains on the floor supports of a bridge as the passage of a consolidation engine. As a 50,000 lbs. coal car could probably be made to measure only 30 ft., or even less, over all, it is possible that in a few years an ordinary train of loaded coal cars will weigh more per foot forward than the testing train of locomotives of to-day.

CHICAGO LAKE COMMERCE.

The Chicago *Tribune* has published a statement of the lake commerce of Chicago during the season just closed which shows an enormous falling off since last year, and, indeed, a smaller tonnage of arrivals and clearances than in any other year since 1878. The number and aggregate tonnage of the vessels arriving and clearing are given as follows:

	1883.	1882.	Decrease.	P. c.
Arrivals:				
No. vessels	11,803	13,351	1,548	11.6
Tonnage	3,756,876	4,849,950	1,093,074	22.5
Clearances:				
No. vessels	11,925	13,626	1,701	12.5
Tonnage	3,962,513	4,904,999	942,486	19.2
Total:				
Vessels	23,728	26,977	3,249	12.0
Tonnage	7,719,389	9,754,949	2,035,560	20.9

A decrease of 12 per cent. in the number of vessels arriving and clearing, and of 21 per cent. in their aggregate tonnage is an important change, and the more so because it is unprecedented. There has been no such decrease as this in Chicago lake commerce, from one year to another, since that city began to have a commerce. A decrease has often occurred, but the largest heretofore (from 1880 to 1881) amounted to but 83,411 tons in the arrivals and 308,693 tons in the clearances, or to 392,104 tons (4⅛ per cent.) in all, against 2,035,560 tons (21 per cent.) reported this year. So great a change may well cause astonishment and provoke inquiry as to what the traffic is that has fallen off so largely.

The *Tribune's* statement gives statistics of the receipts and shipments of the principal articles carried by lake vessels. There are substantially but three kinds of lake traffic, as the miscellaneous shipments are virtually dependent on the other three. At Chicago the tonnage making long voyages is chiefly large vessels carrying grain and flour to Buffalo or other lower lake ports. The Chicago lake receipts of coal, pig iron, salt and merchandise are what these vessels bring back on their return voyage, and they can hardly be said to affect the tonnage of vessels arriving and clearing, as there is never enough of them to give all the vessels full cargoes on the up trip. The shipments from Chicago to lower lake ports other than grain and flour are comparatively trifling.

Another and distinct traffic is that in iron ore from Lake Superior, which is a short carriage when it comes from Escanaba (as probably most of it does), and not a long one when it comes from Marquette. The ore vessels cannot get much to carry up the lakes.

The third traffic, and much the largest of all in bulk, is that in lumber, brought chiefly from ports on the west coast of Lake Michigan and from Green Bay, and to a small extent from ports on Lakes Huron and Superior. The receipts of lumber during the past season must have required more tonnage than would have sufficed for 130,000,000 bushels of grain, while the shipments of grain, flour and seeds amounted to but 68,000,000 bushels. The voyage is comparatively a short one, however, and the tonnage of vessels engaged in it is probably not so large as the tonnage of grain-carriers, for not only are their trips short but their seasons are long. In the spring the Lake Michigan ports are likely to be open nearly a month before the Straits of Mackinaw, and in a mild winter lumber may be taken across Lake Michigan in every month, though usually not in considerable quantities.

Now, of these three branches of traffic there is reported a considerable increase in grain this year (nearly 20 per cent.), a very large decrease in iron ore, due partly to the fact that it goes to South Chicago district, which is not included this year in the Chicago customs district, but was last year, and in lumber there is a decrease of 8 or 9 per cent. The decrease in ore is not equal to the increase in grain, so that we have only the moderate decrease in lumber receipts to account for the great decrease in the tonnage of vessels, together with whatever changes there may have been in miscellaneous trade, chiefly conducted by steamboat lines to Lake Michigan and Lake Superior ports, which can be but a small fraction of the whole, and cannot have very greatly changed since 1882. The reduction in tonnage reported therefore cannot be explained by any statistics of traffic yet published. That the change reported is great enough to warrant inquiry may be seen by the following statement of the Chicago lake commerce for the last 15 years:

	Arrivals.		Clearances.		Total
	Vessels.	Tonnage.	Vessels.	Tonnage.	tonnage.
1868	13,174	2,984,591	13,255	3,020,812	6,005,403
1869	13,730	3,123,400	13,872	3,149,946	6,273,346
1870	12,739	3,049,265	12,433	2,983,942	6,033,207
1871	12,320	3,096,101	12,312	3,082,235	6,178,336
1872	12,824	3,059,752	12,531	3,017,790	6,077,542
1873	11,858	3,225,911	11,876	3,338,803	6,564,714
1874	10,827	3,195,633	10,720	3,134,078	6,329,711
1875	10,488	3,122,004	10,607	3,157,051	6,279,055
1876	9,621	3,089,072	9,628	3,078,264	6,167,336
1877	10,223	3,274,392	10,284	3,311,083	6,585,415
1878	10,490	3,608,534	10,494	3,631,139	7,239,673
1879	11,859	3,887,095	12,014	3,870,300	7,757,395
1880	13,218	4,616,969	13,302	4,537,382	9,154,351
1881	13,626	4,533,558	12,957	4,228,689	8,762,247
1882	13,351	4,849,950	13,626	4,904,999	9,754,949
1883	11,803	3,756,876	11,925	3,962,513	7,719,389

The total amount of lake commerce is best indicated by the last column. We see that it was nearly stationary for the nine years from 1868 to 1876, and in the last of these years was even less than in 1869 or 1871. The average for these nine years was 6,212,000 tons, which the largest shipments (1873) exceeded by less than 6 per cent., while the smallest were but 3½ per cent. less than the average, the differences being hardly as large as would be expected to be caused by the differences in the crops, even in a country which was not growing like the Northwest. The fact is that it was at this time that through rail shipments of grain began to be carried on a great scale, in summer as well as winter. A very low through rail rate (20 cents per 100 lbs.) was first made during the railroad war of 1876, which lasted throughout the season of navigation and resulted in rail shipments on a great scale. The total shipments of grain from Chicago increased from 64 millions of bushels in 1868 and 57 millions in 1869, to 87 in 1876—an increase of more than 50 per cent., while there was no increase in the tonnage of vessels clearing. But after 1876 the increase in tonnage was very rapid, amounting to 2,987,015 tons, and 48 per cent. from 1876 to 1880; the railroad war of 1881 caused a decrease that year from the tonnage of 1880, but in 1882 the tonnage was 6⅝ per cent. more than in 1880 even, and 58 per cent. more than in 1876. After such a great and rapid growth it is surprising to see a decrease this year greater than the increase of any two years has been, leaving the tonnage a little less than in 1871 even, and but 25 per cent. more than in 1876. The only explanation that suggests itself is the omission of the South Chicago commerce, which we should not expect to be large enough to account for more than a small part of the decrease.

The large crop of wheat last year and the larger crop of corn should have tended to make the shipments this year exceptionally large Actually the 68 million bushels shipped this year were much larger than the very light shipments of 1882 or 1881 (about 58 millions each year), but they were very much less than the 106 millions carried in 1880. But as we noticed at the time, last year's crops were shipped to an unprecedented extent during the months when the lakes were closed, and consequently by rail, notwithstanding which the rail shipments since navigation opened this year have been an unusually large proportion of the whole. Yet the competition of the railroads for the grain has been not nearly so severe this year as in some others—as in the whole of the seasons of 1876 and 1881, in a large part of the season of 1879, and in smaller parts of some other seasons. This might be thought to indicate that it is less possible than heretofore for the lake vessels to compete with the railroads for the grain shipments even when the railroads are maintaining paying rates; but we suspect that this is not true as a general proposition, and that the water route is just as effective as ever as a competitor for that part of the grain which it can deliver where it is wanted, which is limited, speaking generally, to grain consumed at canal towns in New York and at New York city, and to grain exported. The railroads carry by far the larger part of the grain consumed in this country at points not reached by canal boats, and it is because most of the grain this year has been required for domestic consumption and comparatively little of it exported that the lake vessels have carried a smaller proportion of it than usual this year. Probably the expectation and almost certainty of having low winter rail rates has something to do with this also. Shippers would be more likely to hurry forward grain by lake in the fall if they expected to have to pay 40 or 45 cents per 100 lbs. for carriage by rail in the winter, than when the

winter rate, as this year and during the past two winters, is but 30 cents.

It may be interesting to see how great that part of the Chicago shipments is for which the railroads compete. They are limited chiefly to grain, flour and provisions going to lower lake ports. There are some shipments of these commodities to Lake Michigan and Superior ports for domestic consumption, but by far the greater part of them go "through" to the East, and could be carried by the eight Chicago roads which connect with the Eastern trunk lines. During the last season these lake shipments, so far as traceable, were about 1,800,000 tons, while the total through rail shipments to the East this year will probably be about 2,300,000 tons. There is therefore a great deal of room left for the railroads to divert lake commerce. The shipments from lower lake ports to Chicago which also the railroads could carry perhaps amount to two-thirds of the down shipments, and the railroads compete for these more sharply than for the Chicago shipments, because they can carry additions to the freight westward without adding to train mileage or car mileage, and consequently with very little increase of expenses. But there is now no indication that the railroads will make a further reduction in through rates in order to divert more lake shipments; they have had some very unsatisfactory experience in doing this, or rather in carrying at rates so low that they resulted in diverting an unusual amount of freight from the lake vessels, for the reductions have not been made for this purpose, but in course of competition with each other. We suspect that unless there is some considerable reduction in the railroad expenses the lake vessels will be able to carry the largest part of the *export grain* for some years to come. But they are limited chiefly to that. What is used for home consumption, a constantly increasing quantity, and by far the larger part of the flour, and nearly all the provisions, not to say the live stock, the railroads will continue to carry. Now the domestic consumption increases rapidly, and will continue to do so as long as population increases east of Ohio, but an increase in exports is not so certain; and in the long run exports are not likely to increase so rapidly as the home consumption. A great growth in lake shipments from Chicago, therefore, seems less likely than a great growth in rail shipments. The lake commerce of that port, we see, was nearly stationary for a long series of years until 1877. After the past few years of very rapid growth it may, perhaps, become stationary again.

The collision at Humber, Ont., Jan. 3, seems from the telegraphic reports to be one more addition to the already long list of disasters which result from carelessness on the part of a trainman, and which are consequently referred to by coroners' juries as cases in which "the company is exonerated from all blame," but which nevertheless could be largely prevented by proper action on the part of the management just as surely as death and disaster from broken wheels can be (and are) prevented by scientific foresight in the selection and manufacture of the iron and steel of which the wheels are made. There is altogether too much complacent reliance upon the theory that human fallibility is inevitable and irremediable; that making an example of the culprit is the only possible preventive measure that can be taken, and that an inscrutable Providence is largely responsible for woes of this class.

We do not know what the train rules of the Grand Trunk Railway are, but presume they require, as those of probably every road in the United States does, that the locomotive runner shall regard himself as *equally responsible* with the conductor for the safe management of the train. Certainly no manager with any degree of caution could require any less than two men to watch over such an important matter, and yet in this, and in previous similar cases, we hear little or nothing about any joint responsibility, all parties agreeing in throwing the whole burden upon the conductor or other person who is *immediately* to blame. In many cases, doubtless, the management prefer to let the blame be wrongfully apportioned between two or more employés rather than allow the matter to be aired and thus incur the risk of having its own responsibility exposed.

Now no one claims that any man is infallible, and assuming that the engineman had orders not to rely upon the conductor for his safety, why did *he* not study the time-table, and so, as is intended by the management, become the check upon the carelessness of the conductor? This, it seems to us, is the vital question in this matter, and there are doubtless very many superintendents' offices beside that of the Grand Trunk where it could be profitably discussed.

Is it to be supposed that this is the first time that the runner in question ever assumed the right to the road without looking to see if the conductor had made any mistake? It is to be feared that not only has he been careless heretofore in this particular, but that the same thing is quite common on that and many other roads. We have assumed that this runner had been told his duty; but how faithfully was it impressed upon him? Perhaps the sending to him of a printed page comprised the whole process so far as the management is concerned. This is the way it is done on many roads; but who will say that this is enough where such important interests are at stake? Familiarity breeds contempt, in serious matters as well as others sometimes, and a lesson which has yet to be learned in a good many railroad offices is the duty incumbent upon the superior officers of not only *laying down* the rules to the enginemen, conductors, etc., but of *hammering them in*, and of watching systematically to see that they are obeyed, not only when accidents result, but at other times and all times.

Let us suppose a road on which the division superintendent periodically catechises his men, repeating the process often enough to make him skillful in finding out what a man knows by what he does, not say as well as by his direct answers; would there not be a better understanding at headquarters of the qualification of the men than there is on many roads now? Would not the superintendent be led to suspect inefficiency in some cases where he is quite sure to remain in blissful ignorance under the present common plan of assuming, after a man is once placed in a responsible position, that he is perfectly fitted for it and that he always and habitually does what he has been told to do? Take almost any case of an engineman going wrong by reason of his carelessness in following the standing rules; as, for instance, the frequent crossing collisions caused by "not seeing the signal," resulting from disobedience of the plain rule that *both* engineman and fireman must see the signal before proceeding; is it not quite likely that this disobedience has been more or less habitual? And is it not the duty of the division superintendent, or of some one, to *find out*, by catechising, or in some way, whether this is so or not?

One of the simplest facts of every superintendent's experience is the certainty with which a portion of any class of employés will neglect duties which, like this, *seem* to be a useless matter of red tape. Of course, we do not forget that division superintendents, like everybody else, have limitations, and that often, perhaps generally, the reason they do not do more or better work is that the management has already placed upon their shoulders more than they ought to carry. Where this is the case, the problem simply resolves itself into a demand for more superintendents, or inspectors to assist superintendents, and a better division of responsibilities.

We have, perhaps, asked more questions than we have answered, but we trust that their consideration will be helpful toward solving the main question which was first stated; and it may be more profitable for the reader to answer them for himself, in the light of his own experience, than to read anything further we might say on the subject.

The fact that a heavy engine and a baggage car at the front of the ill-fated train would have somewhat broken the force of the shock, and so mitigated its murderous effects, is, of course, now patent to every one; but the art of locking the door *after* the horse is stolen has been well known from time immemorial. Is it not about time that some force stronger than has yet been used be brought to bear to induce the practice of more systematic foresight and less "hindsight?"

The Delaware, Lackawanna & Western is reported to have refused to accept an award of a percentage of the New York shipments made by Mr. Fink, and also refused to submit the matter to arbitration. What it meant, then, by joining the combination of the trunk lines it is difficult to understand, for the essence of their agreement is the acceptance of awards of percentages of traffic made by specified methods. The Lackawanna has carried more than 12 per cent. of the New York shipments, which is what Mr. Fink is said to have awarded it, but it has been mostly low-class freight, and probably at full rates would not have yielded more than 12 per cent. of the total gross earnings from this freight. But the Lackawanna has doubtless carried substantially the whole of this freight at less than the regular rates, and could not possibly have secured so large a proportion of the business at full rates, or if the other roads had generally reduced their rates to meet it. Thus 12 per cent. of the freight assured to it at full rates is likely to yield it considerably larger profits than it has ever had from its New York traffic heretofore.

The trunk-line connections west of Buffalo have been asked to refuse to exchange through cars or pro-rate with the Lackawanna if it carries at less than full rates, in accordance with the rules of the Joint Executive Committee. If it succeeds in commanding a traffic notwithstanding this there will be nothing left but to reduce the regular rates to a level with those made by the Lackawanna. This doubtless has been done secretly in a great many cases already by the railroads acting separately, which has been an unfair discrimination against those of their customers who have been charged the regular rates, and ought to be stopped.

The West Shore road, it is reported, is given 12 per cent. of the New York shipments from the beginning, which seems a very large amount, for it is not only a new but an incomplete road, about 250 miles being a single-track line. But it is doubtless able to carry much more than this proportion of this freight, as almost any of the old roads could carry the whole of it, when east-bound traffic is reasonably active, without putting on an additional car. And the old roads have to consider not only what the West Shore can command if compelled to compete for the traffic, but what they will lose while it is engaged in "building up a business by competition." The result of the Lackawanna competition to the other roads has been that it has for six months past taken perhaps one sixth of the shipments from them and considerably reduced their profits on much of the rest of it. Now it may be very true that the Lackawanna has not made as much profit on the 16 per cent. which it secured by competition as it would have made on 8 per cent. awarded to it at full rates; but the old roads have lost perhaps as much as if the Lackawanna had taken 25 per cent. of the traffic and rates had been maintained. Thus it is cheaper for the old roads to give the newcomer more profit than it could make by means of competition, because thus they save themselves from great losses. The Lackawanna chose to establish itself by means of competition, and in any division of traffic it is entitled to a share large enough to give it all the profits which it can, in the long run, make in that way, but not by any means to all the profits that can be made at full rates on all the traffic which it can secure in that way. Still more, we will say that it is entitled to *that proportion of the total profits* which it can make in that way. For instance, if it secures one-sixth of a total traffic which at full rates would produce $6,000, but at 20 per cent. less than the regular rates, and if this compelled the other lines to reduce the rates 10 per cent. on the other five-sixths, then the Lackawanna would receive $800 and the other roads $4,500 *gross* for the traffic. Assuming the expenses to be only 30 per cent. of the *regular* rates, the Lackawanna would pay out $300 and the other roads $1,500 for carrying the traffic, and there would be left as net earnings $500 to the Lackawanna and $3,000 to the other roads. Now this $500, by the assumption, is the maximum profit that the Lackawanna could make by competition, and is just one-seventh of the total profit which can be made under competition. Now it is not proper that the Lackawanna should be limited to this profit of $500 under an agreement to restore rates, any more than that the other roads should be limited to the $3,000, which is their maximum profit under competition. The co-operation of all is necessary to an increase in their profits, and they are entitled to share in the total profits in proportion to their shares when they act independently. By co-operation and the maintenance of rates the total profits would become $4,200, and the Lackawanna would be entitled to one-seventh of this, as it obtained one-seventh of the profits under competition, and it should have such a share of the traffic as will produce this proportion of the profits. While it secured 16⅔ per cent. of the *traffic* and 15.1 per cent. of the *gross earnings* under competition, it made but 14.3 per cent. of the *profits*, and the profit is the object sought.

This principle is applicable not only to cases where some roads usually carry at lower rates than others, as the Grand Trunk out of Boston, but to those where the expenses by one route are decidedly greater than by others; for the interest of a road in a business is measured solely by its profits from that business or affected by it. In the case of west-bound shipments probably no difference in expenses would be admitted, as usually all the roads have more cars going west than they can get freight for, and the addition to the expenses caused by taking the freight consists chiefly in the cost of handling it, which is as great on a long as on a short line.

All the figures as to rates, reductions, etc., that we have given are pure assumptions, intended to illustrate the principle that profits and not gross earnings

and still less tonnage should govern in making an agreed distribution of traffic. The Lackawanna's case is further complicated by the fact that the traffic which it has carried was chiefly low-class freight, so that at full rates its percentage of the total traffic would have yielded a much smaller percentage of the total earnings.

An investigation of the condition of the Oregon & Trans-continental Company, by which the Villard interest held the control of the Northern Pacific and the Oregon Railway and Navigation Company, and which served as a sort of finance and construction company for the Northern Pacific branch lines, was made because there were rumors that the company had used up its assets and there was great distrust of it. Under these circumstances there should have been a full and complete statement of the company's assets and liabilities, including contingent liabilities. But the committee of investigation, consisting of two of its directors and the President of the Farmers' Loan and Trust Company, made a report which is too general to be satisfactory, and omits certainly one important contingent liability. It catalogues the number of shares of each kind of stock which form the chief assets of the company, $2,000,000 of Oregon & California second-mortgage bonds, a balance of $1,240,000 due from the Northern Pacific, $421,000 as the valuation of the Puget Sound Railroad, which is probably what it has cost the Transcontinental Company, while it has not yet issued any bonds on it; an account against the Oregon Improvement Company for $514,000 and some real estate and cash. At the prices when the report was rendered the stocks were worth about $25,700,000; no Oregon & California second-mortgage bonds have been issued yet, we believe: the last quotations for its first-mortgage bonds were 97. The total assets have been estimated by those who look upon the company favorably as of the value of $28,300,000. Against these the company has liabilities—bills and accounts payable—amounting to about $11,000,000. This, if this were all, would leave a balance of $17,300,000 worth of property, at present prices, for the 400,000 shares of Transcontinental stock, or $43¼ per share. But this is not all. The company is under contract to construct a number of branches of the Northern Pacific, receiving branch bonds in payment, but assuming the interest on these bonds for two years. These branches are mostly completed, we believe, but in the ordinary course of things the Transcontinental Company would have to pay the interest on the cost until two years after their completion. The report of the investigating committee says that "The committee are informed that the bonds yet to be received from the branch lines will meet the requirements for construction." Now "information" of that kind is not what an investigating committee ought to be content with. We are told, though we cannot vouch for the information, that a syndicate was formed before or during the investigation which contracted to take the Northern Pacific branch bonds and meet the liabilities for the construction and interest. A definite statement to that effect from the investigating committee would have cleared up the doubt as to the company's ability to meet this liability. But this is not the only liability left unaccounted for in the report. The Transcontinental Company has contracted to complete the extension of the Oregon & California Railroad by July, 1885, through a difficult country which has few inhabitants or productions, to meet the Central Pacific's California & Oregon line at the California line, taking its pay in bonds; and it also leases the road on terms which make it responsible for the interest on the whole funded debt of the Oregon & California Company and a dividend on its preferred stock. There are 177 miles of this extension, and there is to be an issue of $20,000 per mile of first-mortgage and $10,000 of second-mortgage bonds on the whole road. When completed there will be $10,240,000 of first-mortgage sixes and $5,120,000 of second-mortgage. In 1883 and 1884 the lessee is to pay 2½ per cent. on the $12,000,000 of preferred stock. The latest information is that $7,400,000 of the firsts and $3,750,000 of the seconds have been issued, the interest on which is $706,500, while the dividend on the preferred stock is $300,000, and a further sum of $20,000 a year is to be paid by the lessee to meet the expenses of maintaining the organization of the lessor company. Thus, without any further additions to the road, the rental to be paid by the Oregon & Transcontinental Company will amount to $1,026,500. Now for the year ending with March last the *gross* earnings of the Oregon & California Railroad were but $288,117. The committee reports $2,000,000 of these second-mortgage bonds were supposed to be in the possession of the Transcontinental Company, but even if no interest has to be paid on them the rental will amount to $886,500. The extension is not likely to yield an addition to earnings much if any greater than the increase in expenses until it is completed through, so as to open a line between Portland and San Francisco.

Now, a contract of this kind creates a liability of an important kind, and if it is not susceptible of listing like shares and bonds, it is susceptible of such description as will give an approximately correct idea whether it is likely to cause receipts in excess of expenditures, or the contrary. The nature of the contract would indicate that it was expected that a large part of the rental for some time should be paid out of the proceeds of the bonds; and it is not impossible that arrangements have been made for placing these securities and fulfilling the obligations of the Transcontinental Company. If so, it ought to have been explained. The contracts for extending and leasing the Oregon & California road had been executed and were known to exist and to render the Transcontinental Company liable for the payment of large amounts yearly. If in any way it has been relieved from that liability, the fact should have been discovered and announced by the investigating committee.

East-bound rates were reduced last Saturday from the basis of 30 cents per 100 lbs. for eighth-class freight from Chicago to New York, the winter rate which took effect Nov. 26, to 20 cents, to meet irregular reductions which had been made by some of the lines at some places. Cutting rates had been going on for a long time, but only recently were any as great as this, which now becomes the open rate. The reduction takes away probably two-thirds of the net earnings on the east-bound freight, and a road which had been getting 5,000 tons a week from Chicago to New York at full rates will suffer more from the reduction than if its traffic had been reduced to 2,000 tons a week and the rates maintained. The difference in the profits on shipments from Chicago alone as large as those of January, February and March last year would amount to no less than $1,452,000—a tremendous fine to pay. On the total through shipments from the West it would perhaps be three or four times as much as this. No possible falling off in traffic would be so formidable as this great reduction in rates, the whole of which is a reduction in profits. The two new roads to Chicago have taken 19 per cent. of the traffic, and that was considered, and was, a serious matter for the old roads. Now the struggle to get business away from each other, after all the roads had agreed to divide it, results in action which is more harmful while it lasts than six new roads which should take as much as the Chicago & Atlantic and the Nickel Plate. But the more harm it does the more good it will do; the violations of the agreement to maintain rates had been practiced so long with no more serious consequences than complaints and protests and some irregular reductions to meet the cuts, that those guilty of them felt that nothing more would happen. Now that they have no margin left for cutting, and are having the value of the winter's business almost entirely ruined, it is to be hoped that they will acquire a realizing sense of the dangers of their practice. It is, of course, desired and hoped that something may be done which will give assurance that rates will be maintained hereafter, and that the rates will be restored. But until there is some assurance that an agreement to maintain rates will be kept, it will be better, probably, that the business be kept unprofitable.

The reduction of rates from 30 to 20 cents per 100 lbs. may start forward the great stocks of wheat that have accumulated in Western elevators; it makes a difference of 6 cents a bushel in the cost of exporting wheat, and as the announcement is that the rate is temporary, and that the old rates will be restored as soon as possible, it would seem that the natural result would be to cause holders to hurry forward their grain as fast as they can get cars. But, on the other hand, we must remember that rates have not been maintained at 30 cents; that some shipments were even taken at 20 cents, and that notwithstanding this shipments fell off largely in the last half of December, so far they remain small.

We showed recently that an increase of 90 per cent. in traffic was necessary to make up in *gross earnings* to the old roads the diversion of the 30 per cent. of the total Chicago shipments which the three new lines has secured, and the reduction from 40 to 30 cents in the through rate, since the winter of 1879–80. At the 20-cent rate it requires 2,857 tons to yield as much to the five old lines as 1,000 tons yielded in that winter. Expenses are greater now, not less, and to yield the same amount of profit at the 20-cent rate this winter it will probably require *fourteen times* as much freight. Of course, we shall not get fourteen times nor three times as much; probably not more than one-fourth more than in 1880.

The Common Pleas Court in Cleveland has enjoined the Lake Shore Company from charging higher rates to one shipper of oil than it charges to the Standard Oil Company, with which it made a contract in 1875 to carry for it for 10 cents per barrel below its regular rates. This seems to us a just decision, and the announcement of a rule which must eventually be generally enforced, and which, if it had been well established and accepted years ago, would have saved the railroad companies from injuries perhaps greater than any that others have suffered by such rebates, the tendency of which is to build up interests which are able to dictate to the railroads. In such cases, when a single shipper has an enormous proportion of the whole traffic, he goes from one carrier to another, threatening to withdraw his whole trade if he is not given an advantage over his competitors, the smaller shippers. If it were an established principle that such a difference was illegal, the railroads would know that the shipper could gain nothing by such a policy, and the shipper would have very little inducement to ask for any reduction—certainly not in the case of petroleum, the cost of transporting which probably affects consumption scarcely at all. What the Standard Oil Company wanted was not a reduction in the general price of carrying oil, which would benefit its competitors as much as itself, but an advantage over its competitors, which it would not have if the reduced rate were open to all.

The decision evidently makes the contract with the Standard Oil Company illegal, for if the railroad company is enjoined from charging other shippers *more* than it charges the Standard Oil Company, evidently it cannot charge the Standard Oil Company *less* than it charges other shippers. The contract thus seems to be void, and the railroad company is left to make rates for the Standard Oil Company just as if no contract had ever been made.

This decision, it must be remembered, is not made by the highest court, and cannot be said to be established as the law of Ohio. We hope it will be taken to the Supreme Court and affirmed; and that it will become established law for the country, evasion of which shippers will know to be impossible, that every shipper is entitled to equal terms on every railroad, and that reductions made for quantity, convenience of shipment, etc., supposed to reduce the cost to the carrier, be permissible only when the conditions of a reduction are reasonably within the reach of all shippers. To give a rebate to a shipper of as much as a thousand car-loads, when it is practically impracticable for more than one shipper, or more than two or three, to command that amount, is practically an unjust discrimination. Indeed, the argument for reductions for quantities is almost wholly fallacious. It is substantially as costly to carry a thousand cars for one shipper as to carry one car each for a thousand shippers; and any advantages in making up full trains, etc., on the shipper's own sidings, should be commuted by a *reasonable* allowance only. Moving freight at the convenience of the carrier—sometimes a very great advantage—can be arranged for with small shippers as well as large ones.

But even if there were some economies to the railroad companies in dealing with large shippers, the power to grant rebates to them is too dangerous to be permitted in any community. The natural result is to prevent the establishment of any new business. A shipper who should secure 10 or 20 millions of grain at Chicago and get a rebate of 5 cents per 100 lbs. on condition of shipping 5 millions a month, would have thenceforward forever virtual control of the grain trade. He could pay more than any one else in Chicago and sell cheaper in the East and in Europe.

But a corollary of this is that *all* secret rebates and contracts for special rates with individual shippers are wrong when made for single shipments as well as on contracts for long periods. The public almost universally condemns the long and exclusive contract, but it looks with favor on the irregular "cutting of rates" which gives now this and now that shipper an advantage over his rivals, and which would come to an end instanter if every reduction in rates to an individual shipper on an individual shipment became at once an open rate to all shippers on all shipments. On this account we believe that the strict and complete application of the rule announced in Cleveland by Judge Blandin will be of great advantage to the railroads.

Grain shipments down the Mississippi were not important last year, amounting to 6,006,663 bushels, while the total shipments of Northwestern markets

were 215,239,000 bushels. Thus less than 3 per cent. of the whole went down the Mississippi. For eight successive years the river shipments have been :

Year.	Bushels.	Year.	Bushels.
1876	1,774,379	1880	15,762,664
1877	4,101,353	1881	12,993,947
1878	5,451,603	1882	8,333,417
1879	6,164,838	1883	6,003,633

The river shipments this year, therefore, have been the smallest since 1878. They were 28 per cent. less than in 1882, 54½ per cent less than in 1881, and 62 per cent. less than in 1880.

Nor is this due to a falling-off in the total shipments, for they were larger in 1883 than in any other year since 1880. In the last named year the river shipments were 6.7 per cent. of the total Northwestern shipments, in 1881 6.6 per cent., in 1882 5 per cent. Now they have fallen to 3 per cent.

The falling-off from 1882 was not due to a decline in the exports ; nor was the supply of grain exceptionally scant last year in the country which can conveniently reach St. Louis and the Mississippi ; for though an unusually small proportion of the crop was produced in 1882 and 1883 in the Ohio valley and the country east of the Mississippi, an unusually large proportion of it was produced in Missouri and Kansas, near to St. Louis and comparatively distant from Lake Michigan. But the great crops of Kansas, not to say the country further north, in 1882 and 1883, evidently have refused to take the river route, but have gone forward chiefly either through by rail, or by rail to the lakes and thence by water. This, as we have just said, doubtless was chiefly due to the fact that the grain was used chiefly for Eastern consumption—in the country east of Ohio or Indiana—and of course it could not reach the country where it was wanted, 600 to 1,200 miles east of St. Louis, by going some 600 miles south of St. Louis.

Now the total exports *have* fallen off since 1881, and the New Orleans exports fell off in 1882, but last year they were nearly as large as in 1881. For eight years they have been :

Year.	Bushels.	Year.	Bushels.
1876	1,676,858	1880	14,620,033
1877	2,930,192	1881	12,292,071
1878	7,416,217	1882	6,366,767
1879	6,884,331	1883	11,7?2,192

Now if we compare these with the river shipments from St. Louis in the first table, we shall find that though from 1879 to 1882, inclusive, the St. Louis river shipments were always more than the New Orleans exports, and, except in 1882, not very different from them, last year the exports were nearly double the river shipments ; and that from 1882 to 1883, though there was a *decrease* of 2,327,000 bushels in the river shipments, there was an *increase* of 5,365,000 bushels in the New Orleans exports. Thus we find that even a growth in the export trade at New Orleans has not sufficed to stimulate the river shipments, which, unless the grain were brought from California (and very little, if any, could have been brought in 1883) seems strange.

Further light on the subject may be given by examining the total New Orleans receipts, which for eight years have been :

Year.	Bushels.	Year.	Bushels.
1876	5,040,284	1880	19,051,677
1877	8,225,351	1881	16,881,323
1878	11,188,849	1882	10,731,856
1879	11,944,406	1883	15,013,865

Thus only 40 per cent. of the New Orleans receipts were by river from St. Louis in 1883, against 77½ per cent. in 1882, 77 per cent. in 1881, 83 in 1880 and 51½ in 1879, 49 in 1878, 50 in 1877 and 31½ in 1876. Thus we have to go to the days before the jetties to find a year when New Orleans received so small a proportion of its grain by river as in 1883.

This indicates very strongly that the Mississippi, notwithstanding the improvement of its mouth, has proved unsatisfactory as a route for grain shipments. If the New Orleans exports had decreased last year, that might have explained the smaller river shipments; but to find the New Orleans receipts increase 40 per cent. and the New Orleans exports increase 84 per cent., while at the same time river shipments *decreased* 28 per cent., makes it appear that the river is not a favorite route for grain shipments.

An engineer writes to us from the other side of the continent, saying that there is where he is engaged something of a controversy with regard to an alleged "improvement" in the construction of Howe truss bridges which is proposed by a gentleman who holds the position of superintendent of bridges on a railroad, and therefore should have a thorough knowledge of the principles governing their construction. This man, says our correspondent,

"has conceived the idea of extending the bolster or cosbel about eleven feet from the end of the bottom chord, thus bringing it past the first panel point and allowing the tie rods to pass through both bottom chord and bolster. This strengthens the bridge and reduces the liability of the rods shearing off chord timbers at this point. He claims that there is a tremendous shearing strain at the first panel point from each end of bottom chord, and that bridge engineers overlook this fact.

"In the report of the accident at Glen Falls Bridgeon the Glen Falls Branch of the Rensselaer & Saratoga Railroad, I see it stated that in the spring of 1883 such a bolster was put on this bridge, and in the judgment of the Chief Engineer and others this did not strengthen the bridge materially.

"Mr. —— also claims that when a bridge abutment is set on a skew amounting in length to one panel, or on an angle 35° less than a right angle, the braces cannot be kept in place, but will jump out of the truss as soon as a locomotive comes on to the bridge.

"Is it possible that all the bridge engineers in the country have overlooked the fact (according to Mr. ——), that the bottom chord of a wooden bridge must be stronger next the abutment than in the centre of the span ?

"If Alonzo Groat is censured on account of not testing his bridges, and Mr. Wentz and Mr. Voorhees condemned for putting and keeping such a man in such a responsible position, would you be surprised to hear of faulty construction and accidents on Mr. ——'s division ?"

The use of a corbel extending one full panel does no harm. Whether it does any good to some particular form of bridge can only be told by an examination of such a design. A properly designed lower chord should not need such an addition to make it do the duty that comes upon it. The additional timber would be of more use packed in with the other chord pieces than if attached below as a corbel.

The "tremendous shearing force" at the first panel point is simply the accumulated load carried through this point to the abutment, and if the bridge is properly designed, it has been considered in giving the proper sizes to the chords, braces and rods at this point, and similarly for all the other panel points. It is no reason, therefore, for adding a corbel to this particular panel point.

The benefit of a corbel is twofold; first, to distribute more evenly upon the bearings the end pressures; secondly, to raise the chord timbers up from the bearings, where they will be less liable to moisture and decay.

There is no more reason why the braces should jump out of a properly designed skew bridge than out of one with square ends. We have heard such a claim made before.

When local builders of bridges make the claim that they have improved well-known styles of bridges, and that all other builders have overlooked important points in such designs, it is well to ask if such local constructors are perfectly posted as to the best proportions and forms generally used by the most experienced builders elsewhere in this country.

If our correspondent represents the ideas of the abovementioned builder correctly, we think the latter has yet to learn the first principles of bridge designing.

One of the elementary principles of a girder is that the greatest shearing strain occurs where the chord strains are the least, and the reverse, the greatest chord strain where the shearing strain is the least. The posts, braces and rods must be proportioned at each point to the greatest shearing strain ; and the chords for the greatest chord strains. The connections at each panel point should be sufficient to transfer to the chords the components (horizontal) of the shearing strain at such points. The chord which carries the cross floor-beams must be made with sufficient additional strength and stiffness for this additional strain.

The production and consumption of pig iron in this country in 1883 were substantially as large as ever before in the history of the country, it will surprise most of us to learn, and very much greater than in any year previous to 1882. Mr. James M. Swank, the accomplished Secretary of the Iron and Steel Association, estimates the production and consumption of pig iron and rails for 1883 as follows, and as his estimates are based on accurate knowledge of the output for most of the year, they are doubtless very near the truth:

	1883.	1882.	Decrease.	P. c.
Pig iron production	4,623,323	4,623,323	....	....
" consumption	4,948,323	4,963,278	14,955	0.3
Production of—				
Steel rails	1,200,000	1,304,392	104,392	8.0
Iron rails	100,000	203,459	103,459	50.8
Total rails	1,300,000	1,507,851	207,851	13.8

When we remember that there were about 4,500 miles less new railroad built in 1883, which alone would require about 450,000 tons of rails and a considerably larger amount of pig iron, it surprises us to learn that as much pig iron was consumed in 1883 as in 1882. The decrease in the *consumption* of rails Mr. Swank estimates at 300,000 tons, there having been a decrease in the importation as well as in the production.

Rail consumption is very greatly influenced by the amount used for maintenance and that required for new sidings and second tracks of old roads.

As there were about 11,500 more miles of road in 1883, the consumption by wear was necessarily larger in the later year ; but maintenance is not simultaneous with wear, because the rail is worn for years before it needs renewal. Now, as an extraordinary proportion of the tracks were new in 1883, and exceptionally large renewals had been made for two or three years previous, we should expect the average renewals per mile to be less in 1883 than in 1882, and not greater, and the comparatively small reduction in consumption of 300,000 tons reported by Mr. Swank puzzles us still more.

In any event, we see that the unsatisfactory condition of the iron trade last year was not due to small production or consumption, but to prices lower than had been expected ; and that prices fell so much (from $24.50 to $21 per ton for Bessemer pig at Pittsburgh, and from $40 to $35 for steel rails at Pennsylvania mills) was doubtless due more to a falling off in the demand for consumption in 1884 than to a reduction in the consumption of 1883. Certainly an industry ought to be able to bear the comparatively slight falling-off that is shown by Mr. Swank's figures, when this decrease is from a consumption which had been increasing at the astounding rate of the iron consumption in this country for four or five years previous to 1882. And if there were no more iron works to produce than those in operation at the beginning of 1882, or even in the middle of that year—than the average number in that year—probably the complaint of overproduction would be not nearly so great. But the very great prosperity of the industry for several years naturally resulted in the establishing of many new works and the enlargement of old ones, so that by the time consumption ceased to increase not all the works could be kept busy even with the largest demand that had ever been known. It is common to blame iron-masters for this condition of things ; but it is hard to see how they could help it. If the old works had not been enlarged prices would have gone still higher, and more new works would have been built to share the extraordinary profits, with substantially the same results as have occurred. To ask that the makers of iron should have kept down prices and kept down production at the same time is to ask the impossible. To keep down the price of an article when the demand for it exceeds the supply is beyond the power of any men. An attempt to do it would have resulted probably in giving middlemen the chief part of the profits, while consumers paid fully as much as they would have done otherwise.

The New York & New England Railroad passed into a receiver's hands Jan. 1, apparently much to the astonishment of many interested in it, though it was well known and had been announced in the last annual report that its net earnings in the year ending Sept. 30 last were very much less than its fixed charges, and it has been officially stated since the late election that the floating debt is much greater than the report showed. The directors had arranged that certain parties should purchase the coupons of the first-mortgage bonds due Jan. 1 last, and they did purchase them ; but this was simply a transfer of the obligations of the company from one set of men to another, and the purchasers of these coupons have the same right to demand payment of the company and to sue for foreclosure of the mortgage in case of default that the bondholders had.

The receivership was granted temporarily by the court at the suit of five of the directors, two opposing it. It was argued that some of the floating-debt creditors were pressing for payment, and that there was danger that they would issue attachments on rolling stock and material, and so interrupt the regular operation of the road. It is reported that the stockholders will be called upon to advance money to pay the floating debt, which is substantially their debt, though, of course, they cannot be compelled to pay it, and will not unless they believe that the payment of their debt will make the stock valuable. It is said that the floating debt in excess of assets available to pay it with amounts to $1,300,000, which is $6.50 per share of stock. All of this stock represents bonds of the old Boston, Hartford & Erie Company, and that the holders who have already suffered such losses should have to pay money instead of receiving it is doubtless a great hardship for them.

The New York & New England Company has a funded debt of about $44,000 per mile, while the shares amount to more than $60,000 per mile. The Boston & Albany, a parallel line and the great through line from the West to Boston, has $67,000 of stock and $36,500 of bonds per mile. It has twice as

much equipment as the New York & New England, and more than twice as much second track and sidings, and is in fact a complete trunk-line road, while the New York & New England has but fairly begun to enter into that condition. The latter has, however, secured connections with two important trunk lines, the Pennsylvania and the Erie, and will continue to command a share of the large traffic between New York and Boston. It is much to have secured the position by which it commands a large through traffic, but it remains to conduct it so as to make it profitable. During the last fiscal year it seems that there was a loss rather than a profit on the large through freight traffic carried.

This is in effect one of the new parallel trunk lines. Much of it is not new, but the Erie connection has been but lately completed, and it is through this road chiefly that both the Erie and the Pennsylvania have been able to increase their proportion of the New England traffic of late years. As in the case of some other roads, the effect, so far, has been rather to diminish the profits of old roads than to make satisfactory profits for the new ones. The New York & New England, however, is not properly a new road, though it is a new trunk line. The latter position was gained by a comparatively short extension and the improvement of the old road, and was justified, therefore, by a prospect of a gain of traffic which might never have justified the building of a railroad all the way from Boston to Newburgh.

The Chicago railroads were not able to come to an agreement with the Joint Executive Committee, represented by Assistant Commissioner Pierson, at their conference in Chicago, nor with each other since. The Joint Executive Committee insists that its business is put beyond its control if the Western roads pay commissions to outside agents, as these agents always divide the commission with the purchaser of the ticket. Commissions to regular railroad agents, who cannot sell at less than full rates, the Committee does not object to. The Chicago & Alton and the Rock Island insist that they must pay the commissions as they may think best for their own interests. They say that other Western roads work unfairly against them by paying large commissions to scalpers on other business, and that they need to use this weapon offensively for the travel between Chicago and the Missouri River, where they are able to use it effectively. The Joint Executive Committee met (or partly met) the reductions made in the East through large commissions to scalpers, and arranged to sell tickets only by the Northwestern and such other roads as would agree not to pay commissions in such a way as would make it possible to "scalp" the rates. This set some of the Chicago roads against the others, and now the Alton and the Rock Island make an open *east-bound* rate $4 lower than the regular rate, the same as the Joint Executive Committee makes west-bound. It is understood that the west-bound reduction by the Committee is shared by the roads east of Chicago, so that the Western roads which work with it suffer only part of the reduction, while those who do not work with it suffer the whole. In this way it will be *possible* for the Committee roads to make a rate which the other roads cannot meet. They might, for instance (though not without a great disturbance of their own rates), make the rate to Council Bluffs and Kansas City the same as the rate to Chicago, giving the Western roads that work with them their proportion of the $20. To meet this the other roads would have to carry the passenger for nothing.

There seems to have been a needless amount of heat generated in this controversy. It can hardly be said that there is any right or wrong about it. The Eastern roads find their profits reduced by a certain policy pursued by the Western roads. The Eastern roads are justified in pursuing any policy which will prevent those losses. It will be a wise policy if it is a successful one. Some of the Western roads claim that they must follow the policy of paying outside commissions because it is followed by some of their competitors who are wholly beyond the control of the Eastern roads. Now this may justify their action, but it makes no difference to the Eastern roads. They are bound to help themselves if they can, and they are not bound to remedy evils which are beyond their reach. But neither does it make any difference to the Western roads if their legitimate efforts to protect themselves against Western competitors hurt the Eastern roads, unless they have more to lose by the action of the Eastern roads against them than they have to gain by their ability to fight their Western competitors freely. The Rock Island and the Chicago & Alton are shooting at a Western enemy. The Eastern neutral party is in a position where some of the shots strike it. It puts up breastworks for its own protection, but the Rock Island and Alton object to these breastworks because they intercept their fire against their enemy. The neutral party, however, cannot be expected to expose itself, *if it can help it*, in order to let a fight go on in which it has no interest.

December earnings have been reported so far by 32 railroads, counting the Missouri Pacific and the Iron Mountain together as one, and also the Missouri, Kansas & Texas and the International & Great Northern. The aggregate mileage, earnings and average earnings per mile of these roads in December for the past two years were :

	1883.	1882.	Inc. or Dec.	P.c.
Miles	34,527	31,314	+ 3,213	3.2
Earnings	$17,304,932	$16,271,032	+$1,033,900	6.4
Earn. per mile	501	520	— 19	3.7

Ten of the 32 roads or systems report a decrease in total earnings, and 18 a decrease in earnings per mile. The number is too small to enable us to draw a general conclusion concerning the railroad earnings of the country. Most of the Northwestern roads make gains in total earnings, but not in earnings per mile. Indeed, of nine roads north and northwest of Chicago only three—the Milwaukee & St. Paul, the Chicago & Alton and the St. Paul & Duluth—have any increase in earnings per mile, and the decreases are larger on the Central Iowa, the Canadian Pacific, the Chicago & Northwestern, and the Manitoba. All the Gould Southwestern roads show a decrease except the Central Branch, which is exclusively a Kansas road. Probably reports of the Missouri Pacific separate from the Iron Mountain, and of the Missouri, Kansas & Texas separate from the International & Great Northern would also show handsome increases, their good earnings being neutralized by bad ones in Kansas and Texas. It may not be proper to call these bad because they are not so good as last year, however, for they were unprecedented last year. The Wabash has an important gain—greater than it has shown before for a long time, though it had very little increase in mileage. Indeed, while an increase of only $170,105 was made in the whole year by this company, it gained $186,333 in December, thus in that month changing the result of the year from a decrease to an increase.

If we compare the gains and losses with those made by the same roads last November, we shall find that generally the increases over 1882 were much smaller in December than in November, that indeed the aggregate increase of the 32 systems was $1,630,000 in November and but $1,033,000 in December. Still there are some notable exceptions. The Chicago & Eastern Illinois, which had a decrease of $18,500 in November, has a small increase in December; the Indiana, Bloomington & Western lost $21,000 in November and gained $30,000 in December; the Missouri Pacific (including the Iron Mountain) lost $63,000 less in December than in November, and the Manitoba $14,000 less. Most important of all, the Wabash's increase was $186,300 in December, against $34,400 in November. On the other hand, the Canadian Pacific's gain was but $83,000 in December, against $211,000 in November; the Northwestern has a decrease of $20,000 in December against an increase of $248,000 the month before; the Milwaukee & St. Paul's increase was $129,000 less in December; the Louisville & Nashville gained but $11,300 against $74,000; and the Missouri, Kansas & Texas transforms a November gain of $146,600 into a December loss of $39,600. Generally, then, these roads did not do as well in December as in November. That will probably appear to be the case with many of the roads whose reports are not yet received.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads in 1883 as follows:

Chicago, Burlington & Quincy.—A branch is completed from Kenesaw, Neb., southwest to Holdredge, 39 miles.

Chicago & West Michigan.—The *Newaygo Division* is extended from West Troy, Mich., north to Baldwin, 13 miles.

Duluth & Iron Range.—Track laid to a point twenty miles north of Agate Bay, Minn., an extension of 5 miles.

Georgetown & Lanes.—Extended westward to Lanes, S. C., 17 miles. Gauge, 5 ft.

Grand Rapids & Indiana.—The *Manistee Branch* has been extended from Deer Lake, Mich., to Raguel, 7¼ miles.

Lac la Belle & Calumet.—Completed from Lac la Belle, Mich., to Delaware Mine, 7½ miles. Gauge, 3 ft.

Louisville, New Orleans & Texas.—Extended southward to Magnolia, Miss., 20 miles.

Oregon & California.—Extended southward to Central Point, Or., 30 miles.

This is a total of 138¾ miles of new railroad, making 6,269 miles thus far reported for 1883. The total new track reported in our columns to the corresponding date for 12 years past has been as follows:

	Miles.		Miles.
1883	6,269	1877	2,919
1882	10,328	1876	2,278
1881	7,870	1875	1,333
1880	6,139	1874	1,844
1879	3,801	1873	3,630
1878	2,263	1872	7,160

The statements include *main track only*, no account being taken of second tracks or other additional tracks or sidings.

THE WEST JERSEY & ATLANTIC RAILROAD, which has just declared its first dividend (of 4 per cent.), furnishes an unusual illustration of the profits resulting from the transportation of a large number of through passengers over a comparatively short line at very low rates of fare. The company was organized five or six years ago to build a road from Newfield, on the West Jersey, eastward 34 miles to Atlantic City, the nearest seashore resort to Philadelphia, and at that time reached by the Camden & Atlantic and the Philadelphia & Atlantic City (narrow-gauge). It was built in the interest of the West Jersey, which gave it a traffic guarantee of 25 per cent. upon all traffic given to or coming from the line, that traffic guarantee to go first to making up any deficiency in meeting the interest and second to the cancellation of the bonds. The road was organized with a capital stock of $1,000,000 and $500,000 first-mortgage 6 per cent. 30-year bonds, subject to being drawn at 105. Many of the stockholders were interested in land along the line, and the road was built thoroughly but cheaply. The line runs for four-fifths of the distance through the Jersey barrens over level ground worth hardly five dollars an acre, and the right of way cost comparatively nothing. Twenty shares of stock (par $50) went with each $1,000 bond, and it was thought that the bonds would build the road without equipment or terminal facilities save at Atlantic City, where the cost was not great; and yet after an assessment of 15 per cent. upon the stock there was left a small floating debt. The road had hardly been opened when the fatal accident at May's Landing occurred, in which 17 lives were lost. This entailed a loss of $81,000 for personal damages, and they were compromised by Mr. George M. Dorrance, the agent of the company, so that not a single case was taken into court. The loss was shared equally by the West Jersey and the West Jersey & Atlantic, and scrip issued for $60,000 to meet this indebtedness and other incidentals growing out of the proper completion of the line.

The freight mileage of this road was only 791,631, and its average earnings 2.08 cents per ton per mile, with a cost of 2.355, entailing an actual loss of 0.275 cent per mile, but the amount carried was so insignificant that the actual loss was only $2,142 for the year on total receipts of $16,469. The passenger business, on the other hand, brought a revenue of $133,828, and the average earnings were only 0.969 cent per mile. The rate for through passengers (64 miles) on excursion tickets for the round trip is in some cases as low as 50 cents, and the rate of fare for round-trip tickets good for 10 days only $1.50, so the average fare per mile is probably the lowest in the country, 0.969 cent per mile But the excursion traffic is done at an average rate of 25 miles an hour without stopping, so that engines haul with ease as many as eighteen or twenty cars if pressed, but the speed with express trains making 64 miles without a stop is a little more than 40 miles an hour, and they are sent out in two sections when they exceed eight or nine cars. And yet this traffic is handled at a cost of 0.626 cents per passenger mile, leaving a profit of 0.343 cents, in spite of the winter months, when the road barely pays expenses. The average cost per hundred miles run for passenger engines was $16.90.

The financial showing has been equally satisfactory to the stockholders and the operating company. The former have received their 6 per cent. regularly upon their bonds, and after five years they receive 4 per cent. dividend upon their stock with only 15 per cent. paid in. The road earned in 1881 a surplus of nearly $25,000, and it enters upon 1884 with a surplus of $67,000, which its 4 per cent. dividend will only reduce to $40,000. Meanwhile the West Jersey under its traffic contract paid over to the sinking fund for the first-mortgage bonds 25 per cent. on $135,284 of traffic brought from and given to this road. As its operating expenses were only 59.1 per cent., and this was the best paying part of it, the company profited over $20,000 directly, and in return for its contribution it received stock upon which it now begins to receive dividends. Ultimately the West Jersey will have paid off the entire mortgage in this way, and will have the majority of the stock in the road free from debt.

THE LEHIGH VALLEY RAILROAD is the first of the great anthracite coal companies to make its report of tonnage for the year and the second in importance. In many respects it occupies a more independent position than any other, if less commanding than some of its rivals. It is the more independent because its conservative policy has prevented the assumption of liabilities sufficient to prevent it from making a regular annual return of income to its stockholders, even through the dark days of the panic. It has always been managed in the interest of its stockholders and the communities which it serves, and the amicable relations which it sustains to other roads are best illustrated by the fact that it is the only corporation in the country which has the right to run its own engines over the tracks of the Pennsylvania, the New York, Lake Erie & Western and the New York Central.

In a general way it is known that the Lehigh Valley has

earned more money than ever before in the past year, and perhaps its net earnings may exceed those of the previous year, when they were the largest ever known. Its coal tonnage has now been steadily increasing each year since 1877. The increase for 1883 is less than for 1882, when it was 7.4 per cent. less than in any year of the last six, but it has steadily increased its percentage of the total shipments of anthracite and it occupies a central position with the best of facilities for both east and west-bound tonnage. This company has a capital stock of $27,603,195 and a funded debt of $25,013,000, its property consisting of 322 miles of railroad, and an enormous rolling stock (no less than 30,500 cars), and investments amounting to $18.000,000 in real estate and the stocks and bonds of other corporations, by part of which it controls the Pennsylvania & New York and the Geneva, Ithaca & Sayre railroads. Its Pennsylvania system has a capital of a little less than $100,000 per mile, while its Easton & Amboy line across New Jersey has cost it nearly $170,000 per mile.

How important the coal trade is to it may be imagined from the fact that out of its total earnings of $10,160,069 in 1882 no less than $7,158,744, or 70.4 per cent., were from the transportation of coal. Of its net receipts of $4,326,392 coal furnished $3,319,529, or 76.7 per cent. Its passenger traffic yielded a profit of only 26.1 per cent. upon the total receipts, and its freight business other than coal 36 per cent., while coal paid 4[illegible] 3 per cent. of the gross income from its transportation.

The increase in the coal tonnage last year (ending with November, 1883) was 270,253 tons, or 4.3 per cent. There was quite a change in its direction of its coal shipments last year. While the Lehigh Valley delivered to its western line, the Pensylvania & New York, only 825,789 tons, or 12.6 per cent. of the total in 1883, that amount was 117,059 tons in excess of the amount shipped in that direction in 1882, or 16.5 per cent. more, though the western shipments for 1882 were less than in 1881 out of a production 7.6 per cent. greater. This is a significant proof of the growth of the western trade in anthracite coal which has made possible the sale of thirty million tons of coal during the past year. Nor is this the only outlet to the West. There were shipped by the Northern Central 16,194 tons in 1881, 83,716 tons in 1882, and in 1883 151,434 tons, an increase last year of 67,718 tons or 80.6 per cent., and almost every ton of this went west. This makes a total increase in western shipments of 184,777 tons. The company also shipped to tide water over its own line 220,980 tons, or 11.5 per cent. more than in 1882, so that other lines had to suffer, as the increase in these two directions was much greater than the increased production. The Morris Canal tonnage remained about the same. The Lehigh Canal tonnage fell off 20 per cent. in 1882 and 7 per cent. in 1883. The deliveries to the Lackawanna, which were 245,275 tons in 1881, were only 204,928 in 1882, and last year declined to 195,971.

The deliveries to furnaces and manufacturing companies are important, for those on this line using anthracite coal are more numerous than on any other coal-producing road. In 1881 the consumption of these establishments was 762,042 tons, and in 1882 786,630 tons, an increase of 24,588 tons, or 3 per cent. Last year the total stood at 639,971 tons, a loss of 146,659 tons, or 22.9 per cent., but this loss on a road more affected than any other was only 2.2 per cent. of its total tonnage, and its total deliveries to furnaces and manufactories were less than 10 per cent. of its total production, so that it must be plain that the importance of the iron trade as a direct factor in the consumption of anthracite is too often overestimated.

For the week ending Jan. 5 the incomplete report of the through and local shipments of flour, grain and provisions eastward from Chicago shows a total of 32,882 tons, against 64,729 tons in the corrsponding week of last year (when they were extraordinarily large), and 40,481 in the previous week of this year. These are the smallest shipments there have been since August, but the decrease is largely accounted for by blockades of roads which bring produce to Chicago. The difference between this incomplete report made to the Chicago Board of Trade, and the complete report to the Joint Executive Committee, which includes only through shipments (that is, shipments to points as far east as Buffalo, Pittsburgh or some other western terminus of an Eastern trunk line), but includes all kinds of freight, has often been remarked upon. But it seems that the Board of Trade report is often very incomplete, and does not really cover the week ending with Saturday, as it pretends to do, but in many cases the week ending with Friday. The Chicago *Tribune* in its annual review of the commerce of Chicago calls attention to this, and also says that the grain elevators report shipments as they are ordered, and not as they are made, so that when a shipment of 100,000 bushels by rail is ordered, the whole is credited to the day of the order, though it may be several days before it is all put on the cars and actually shipped. So the shipments by vessel are credited to the day when the clearance papers were taken out, though the vessel may not sail for some time afterward. The Board of Trade report which pretends to be for the week ending with Saturday usually includes no Saturday shipments, and not all of Friday's shipments, besides being imperfect in the other particulars mentioned. Thus, the railroad companies' own report of their through shipments is the only one which gives an accurate statement of the movement during the time which it covers. It appears a week later than the other, and therefore receives very little attention, and of course it does not cover the entire shipments, as shipments to points east of the western termini of the trunk lines are not included, and there must now be a large amount of these, including provisions, etc., to the South, by way of Louisville, Cincinnati, etc. These shipments (which are not all "local" properly, but include through business which does not reach the Eastern trunk lines) grow with the increase of manufacturing and mining in Ohio, Michigan and Indiana, which has been very great of late years.

The transcontinental traffic, we have said recently, now goes chiefly by New Orleans and the Southern Pacific, so far as the shipments of the Eastern seaboard states are concerned, at least. Strange to say, this is because the freight generally makes better time by that route, which is 4,300 miles long, 1,800 of it by sea, than by the direct all-rail line, which is only 3,300 miles long. When the New York steamer reaches New Orleans, taking six or seven days by the time the freight is unloaded, the distance to San Francisco is about 150 miles greater than the distance from Chicago. We might expect that the trunk lines could make 900 miles to Chicago quicker than the steamers can sail 1,800 to New Orleans. So they do; the difference is not on that part of the route. But on the arrival of a steamer at New Orleans a train is loaded and dispatched through to San Francisco without other delay or transfer. But by the other route freight is usually transferred at Chicago, again at Council Bluffs, and always, we believe, at Ogden. Thus while freight is moving on the Southern route it is likely to be waiting on the direct one, and the steady-going tortoise comes in ahead of the napping hare, though it has a thousand miles further to run. One would suppose that the success of the Southern Pacific in capturing so large part of the traffic would long ago have led the managers of the several roads to make the California fast freight line a fast freight line indeed, by keeping the cars going when once they get started. Perhaps something will be done about it when the new "Western Trunk Lines Association" gets fairly at work. An improvement in this direction would give the Union Pacific a very decided advantage over the route between Chicago and Ogden formed by the Chicago, Burlington & Quincy and the Denver & Rio Grande. As the latter is a 3 ft. gauge road there must be transfers both at Denver and Ogden, while the distance is 1,820 miles from Chicago to Ogden by this route, against 1,525 by the Union Pacific, while there are probably some places where fast running is unadvisable on the narrow-gauge road. Its through passenger train, however, is timed to run at the average rate of 21¼ miles an hour between Denver and Ogden, while the Union Pacific speed is but 23 miles an hour west of Cheyenne.

Chicago through shipments eastward for the 10 days ending Dec. 31, by the complete report, were 53,489 tons in 1883, against 97,773 tons in 1882—a decrease of 44,284 tons, or 45 per cent. The shipments in 1882 were altogether unprecedented for the season. The percentage of these total shipments carried by each road was:

	1883.	1882.		1883.	1882.
Chi. & Grand T.	10.2	12.8	Fort Wayne	13.7	14.4
Mich. Cen.	17.1	23.8	Ch., St. L. & Pitts.	11.9	15.5
Lake Shore	20.7	24.8	Balt. & Ohio	4.3	8.7
Nickel Plate	10.5	....	Chi. & Atlantic	11.6	....

Thus the three Vanderbilt roads in 1883 carried 48.3 per cent. of the whole. These roads are behind, and must carry more than the regular proportion in order to obtain what is their due by the awards dating from last June. The Fort Wayne and the Baltimore & Ohio are the roads furthest behind in these 10 days.

The shipments of this period were at the rate of 37,442 tons per week, and for seven successive weeks they have been:

Week ending						
Nov. 14.	Nov. 21.	Nov. 30.	Dec. 7.	Dec. 14.	Dec. 21.	Dec. 31.
44,926	43,721	63,548	44,592	54,196	44,480	37,442

The shipments thus have been falling off rapidly since the second week of December. In the corresponding period of 1882 they were increasing, as the following shipments for the last seven weeks of that year will show:

Week ending						
Nov. 14.	Nov. 21.	Nov. 30.	Dec. 7.	Dec. 14.	Dec. 21.	Dec. 31.
44,721	50,401	57,203	*23,976	*49,335	60,294	73,330

* Exclusive of shipments at old rates.

The heavy shipments of the last half of December in 1882 continued through the winter and until April. There is no sign of their beginning yet this year. Even the reduction of the rate from 30 to 20 cents has not yet made the Chicago shipments large.

The Atchison, Topeka & Santa Fe made an immense increase in net earnings in 1883 wholly by reducing expenses, for there was some falling off in gross earnings. For the eleven months ending with November the gross earnings decreased $303,135 (2¼ per cent.), but the working expenses were reduced $1,670,120 (22 per cent.); there was an increase of no less than $1,366,585 (23¾ per cent.) in net earnings. It is not easy to see how so great a reduction could have been possible unless a good deal was charged to maintenance expenses in 1882, which really went for construction. The expenses, which were 56.8 per cent. of the earnings in 1882, were 46.1 in 1883.

The effect of the large crops in Kansas is not reflected by the earnings of the Atchison, Topeka & Santa Fe's gross earnings in November last, which were a trifle less than in 1882, but they are by the Southern Kansas, which had an increase of 28 per cent. in November. The Atchison has a great mileage outside of Kansas, but the Southern Kansas is wholly in that state. The Central Branch, in the northern part of the state, also reported a large increase in November earnings.

A Long Island man proposes to annihilate snow blockades with torpedoes, and he advertises for a man to advance money to test his apparatus "for shooting torpedoes from a locomotive and exploding same in front of the engine, loosening and removing the snow and facilitating an entrance for the train." An interest in the invention is offered for the money so advanced.

Ohio Southern earnings in November were erroneously reported in our columns last week to have been $196 per mile and less than in the other two years that the road has reported. They were actually $268 per mile and larger than in previous Novembers.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Buffalo, New York & Philadelphia, annual meeting, at the office in Philadelphia, Jan. 14, at noon.

Fitchburg, annual meeting, at the passenger station in Boston, at 11 a. m. on Jan. 20.

Indiana, Illinois & Iowa, annual meeting, at the company's office in Kankakee, Ill., Jan. 16.

Lehigh Valley, annual meeting, at the company's office, No. 228 South Third street, Philadelphia, Jan. 15, at noon.

Philadelphia & Reading, annual meeting, in Horticultural Hall in Philadelphia, Jan. 14, at noon.

Dividends.

Dividends have been declared as follows:

Atchison, Topeka & Santa Fe, 1½ per cent., quarterly, payable Feb. 15, to stockholders of record Jan. 11.

Bald Eagle Valley (leased to Pennsylvania Railroad Co.), 5 per cent., semi-annual, payable Feb. 1.

Housatonic, 2 per cent., quarterly, on the preferred stock, payable Jan. 15.

Little Schuylkill Navigation & Railroad Co., 3½ per cent., semi-annual, payable Jan. 15.

Mine Hill & Schuylkill Haven, 3½ per cent., semi-annual, payable Jan. 18.

Oregon Railway & Navigation Co., 2 per cent., quarterly, payable Feb. 1. Transfer books close Jan. 15. This company reduces its dividend from 2½ to 2 per cent.

St. Louis & San Francisco, 3½ per cent., semi-annual, on the first-preferred stock, payable Feb. 1. Transfer books close Jan. 16.

St. Paul, Minneapolis & Manitoba, 2 per cent., quarterly, payable Feb. 1. Transfer books close Jan. 19.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

Master Car-Builders' Club, regular monthly meeting, at the rooms, No. 113 Liberty street, New York, on Thursday, Jan. 17, at 8 p. m. Subject for discussion: "Car Wheels and Axles, including the Seating of Wheels to Gauge on Axles."

New England Railroad Club, regular monthly meeting, at the rooms of the Club in the Boston & Albany passenger station in Boston, Wednesday, Jan. 30, at 8 p. m. Car-wheel makers are specially invited to attend. The subject for discussion will be "The Car Wheel of the Future."

American Institute of Mining Engineers, annual meeting, in Cincinnati, beginning Tuesday evening, Feb. 19. Mr. L. E. Warner, Cincinnati, O., is Chairman of the local Committee of Arrangements. A circular will be hereafter issued giving the details of the meeting.

National Association of General Passenger & Ticket Agents, regular semi-annual meeting, in Cincinnati, O., Tuesday, March 18.

General Time Convention, Spring meeting, at the Grand Hotel in Cincinnati, O., at 11 A. M., on Wednesday, April 9.

Southern Time Convention, Spring meeting, at No. 46 Bond street, New York, at 11 A. M., on Wednesday, April 16.

Railway Car Accountants' Association, annual convention, in Richmond, Va., on Tuesday, May 20.

Foreclosure Sales.

The *Meadville Railroad* was sold at public sale in Meadville, Pa., Jan. 3, and bought for $150,000 by D. S. Richmond as representative of the creditors other than the bondholders. It is said that the real purchaser is the Pennsylvania Company, which operates the road under lease. It extends from Meadville, Pa., to the Erie & Pittsburgh at Linesville, 21 miles, and the bonded debt was $125,000. The purchase money is about equal to the amount of the bonds and accrued interest.

The *Nantasket Beach* road was sold at public sale by the trustees under the mortgage at Hull, Mass., Jan. 7, and bought for $100,000 for account of the bondholders. The road was built entirely for summer pleasure travel; it is of 3 ft. gauge, and extends from Higham, Mass., to Pemberton, on Nantasket Beach, 7 miles. The funded debt was $250,000.

New York Railroad Commission.

A hearing was given by the New York Railroad Commission in Albany, Jan. 3, on several proposed amendments to the laws governing the construction and operation of railroads, which the Commission purposes submitting to the Legislature. The Delaware & Hudson Canal Co. was the only corporation represented at the hearing, although several other companies sent letters requesting a postponement. Of the proposed laws one provides that the Railroad Commission shall indorse the necessity for building a new road before a charter is granted. The restrictions governing its construction are also made more stringent. An increase of capital stock cannot be made unless approved by the Commission. Changes of line must also have the sanction of the Commission. Another prohibits grade crossings unless special permission is given by the Commission, and another provides that negligence of a fellow servant shall not be a defense in cases of action by an employé to recover damages for personal injury.

Only a short session was had, and the hearing was then postponed until Jan. 10.

St. Louis Engineers' Club.

At the annual meeting in St. Louis, Jan. 2, the Committee on Meetings reported, recommending the following programme for the season, which was adopted:

Jan. 2—"History of the U. S. Land Surveys," by Col. H. C. Moore.

Jan. 16—"The Eighteenth Street Bridge," by Carl Gayler; "Utilization of Gas Light," by J. A. Sobolewski.

Jan. 30—"Thermodynamics Applied to Compressed Air,' by C. M. Woodward.

Feb. 13—"Mechanical Use of Compressed Air," by H. Constable.

Feb. 27—"Windmills as Prime Movers," by James W. Hill; "Railroad Problems," by George Burnett.

March 12—"Engineering Photography," by D. C. Humphreys; "The Photometer," by T. D. Miller.
March 26—"Hoists and Travelers," by Frederick Shickle; "Some Questions in River Improvement," by R. E. McMath.
April 9—"Engineering and Lithography," by Edward Moliter; "Flow of Water in Pipes," by Col. Henry Flad.
April 23—"Filtering Hydrant Water," by Edward Flad; "Blue Print Copies," by C. W. Melcher.
May 1—"Creeping of Rails," by J. B. Johnson.
May 21—"Easement Curves," by Robert Moore; "Motion of Water in Stand-pipes," by M. L. Holman.
June 4—Report of committee of three on smoke prevention.

ELECTIONS AND APPOINTMENTS.

American Society of Civil Engineers.—At the regular monthly meeting in New York, Jan. 2, the following candidates were elected members: William Hammond Hall, Sacramento, Cal.; Charles Warren Hunt, New York city; Stillman W. Robinson, Columbus, Ohio; transferred from junior to member, Frederick Brooks, Boston, Mass Elected junior member, Edward E. Magovern, Hoboken, N. J.

American Institute of Mining Engineers.—By appointment of the Council, Prof. Rossiter W. Raymond assumed the office of Secretary on Jan. 1, in place of Prof. T. M. Drown. All communications should be addressed to Lock Box 223, New York city.

Baltimore & Ohio.—Mr. J. G. Foreacre has been appointed General Manager of the Trans-Ohio Divisions in place of Mr. Bradford Dunham, who has gone to the Louisville & Nashville. Mr. Foreacre has served as Superintendent or Manager on the Virginia Midland, the Atlanta & Charlotte Air Line, and recently on the Georgia Pacific road.

Boston, Barre & Gardner.—Mr. Harry M. Marshall, General Freight Agent, has been appointed Superintendent in place of Mr. Henry M. Witter, who retires from the office of Superintendent, but remains President of the company.

Central Iowa.—Seth Zug, previously Cashier, is now Treasurer. J. Howard Pearson has been elected Secretary, in place of Charles Alexander. H. L. Shute is General Freight Agent, in place of C. A. Jewett.

Chicago, Burlington & Quincy.—Mr. T. E. Calvert has been appointed General Superintendent of the Burlington & Missouri River lines in Nebraska. He will continue to act as Chief Engineer also.
Mr. F. J. Cullenbine has been appointed Train-Master of the Chicago Division in place of A. J. Spurr, resigned.

Chicago, Milwaukee & St. Paul.—Mr. W. E. Beecham, Car Service Agent of this company, has been granted a leave of absence on account of continued severe illness, and W. L. Stone has been appointed to the position, with headquarters at Milwaukee. Mr. Stone will have charge of the distribution of cars between the several divisions of this company's line.

Chicago & West Michigan.—Mr. George C. Kimball, General Manager, announces the following changes, which took place Jan. 1: Mr. A. M. Nichols, for 12 years General Freight Agent, takes the position of General Superintendent; Mr. J. H. Palmer, for some time Chief Clerk in Mr. Nichols' department, succeeds that gentleman; Mr. J. W. Petheran, who has been Assistant Chief Engineer for some time, takes the position of Chief Engineer; George W. Dunlap, General Agent, West Grand Rapids, will also have charge of trainmen, the dispatching of trains and distributing of cars between Grand Rapids and Baldwin; Geo. A. Magoon, General Agent, Muskegon, will have charge of trainmen between Allegan and Pentwater, also on Big Rapids Division and Hart Branch; John E. McLane, telegraph operator at Muskegon office, will have charge of distribution of cars north of Ferrysburg, except on Newaygo Division.

Cincinnati, New Orleans & Texas Pacific.—The following circular from President John Scott is dated Cincinnati, Dec. 27:
"Mr. E. M. Johnson, of the firm of Hoadly, Johnson & Colston, of this city, is hereby appointed General Counsel of the whole of the roads forming this system.
"The legal department will be reorganized, and instructions as to the conduct of litigated and other cases will in future emanate from that gentleman.
"The general freight and ticket business of these roads will in future be operated separately.
"Mr. E. P. Wilson is appointed General Passenger Agent of all divisions, with headquarters at Cincinnati.
"Mr. R. E. Munro is appointed Comptroller of all divisions with the duties of Auditor. Agents in future will report to that officer on all matters of accounts, and take his instructions thereon.
"Mr. W. H. Eagar is appointed General Agent at Chattanooga.
"Mr. Barnard Brown is appointed General Freight and Ticket Agent of the New Orleans & Northeastern Railroad, with headquarters at New Orleans, La.
"Mr. I. Hardy, now General Freight and Ticket Agent of the Vicksburg & Meridian and Vicksburg, Shreveport & Pacific railroads, will retain his position.
"Mr. Charles B. Patton is appointed Paymaster of all divisions, except the Vicksburg, Shreveport & Pacific.
"The office of General Master Mechanic is abolished, and Mr. James Meehan, in charge of that department, will in future be known as Superintendent of Motive Power and Machinery.
"All the above appointments date from Jan. 1, 1884."

Cleveland & Pittsburgh.—At the annual meeting in Cleveland, O., Jan. 2, the old officers were re-elected, as follows: J. N. McCullough, President; George A. Ingersoll, Secretary and Treasurer.

Columbus, Hocking Valley & Toledo.—At the annual meeting in Columbus, Jan. 8, the following directors were chosen: M. M. Greene, Columbus, O.; C. H. Andrews, Youngstown, O.; S. Burke, Charles Hickox, Charles G. Hickox, W. J. McKinnie, J. H. Wade, Cleveland, O. The only new director is Mr. Wade, who succeeds J. W. Ellis. The board re-elected M. M. Greene President; S. Burke, Vice-President; W. M. Greene, Secretary; W. N. Cott, Treasurer.

Dakota & Great Southern.—The officers of this new company are: President, Herman Haupt, St. Paul, Minn.; Vice-President, George H. Elsbury; General Manager, Isaac Britton; Secretary and Treasurer, R. B. Sherman; Auditor, J. E. Dyer; General Land Agent. A. O. Squire, Sioux City, Ia.; Superintendent of Construction, F. J. Britton. Offices at Tower City, Dak., except as otherwise noted above.

Des Moines & St. Louis.—This company has elected J. S. Clarkson President; C. F. Meeks, Secretary; D. S. H. Smith, Treasurer. The road is controlled and worked by the Wabash, St. Louis & Pacific.

Georgetown & Lanes.—The officers of this road are as follows: A. J. Twiggs, President and General Manager, Augusta, Ga.; W. A. Aiken, Secretary and Treasurer, Augusta, Ga.; Thomas M. Emerson, General Freight and Passenger Agent, Wilmington, N. C.; P. E. Twiggs, Auditor, Georgetown, S. C.

Georgia Pacific.—The general offices of this company have been removed from Atlanta, Ga., to Birmingham, Alabama.

Grand Rapids & Indiana.—Mr. A. B. Leet having resigned his position as General Freight and Passenger Agent of this company, Mr. C. E. Gill is appointed Acting General Freight, and Mr. C. L. Lockwood Acting General Passenger Agent, to take effect Jan. 1. These officers will have full authority in their several departments, and all communications connected therewith should be addressed to them.
Mr. W. H. Hall having resigned his position as General Agent of this company at Cincinnati, Mr. Frank M. Guthrie is appointed General Agent, with headquarters and office at 113 Vine st., Cincinnati, Ohio, taking effect Jan. 1.

Hartford & Connecticut Valley.—Mr. O. M. Shepard has been appointed Superintendent of this road. He is also Superintendent of the Shore Line and Air Line divisions of the New York, New Haven & Hartford road.

Hot Springs.—The officers of this road are as follows: Jo. Reynolds, President and Manager, Chicago; J. N. Conger, Superintendent and Purchasing Agent, Hot Springs, Ark.; L. Finlay, Master Mechanic, Malvern, Ark.: M. E. Turner, Master of Bridges and Buildings; George Worley, Road-Master.

Indiana, Bloomington & Western.—Mr. J. F. Allen, late Paymaster, has been appointed General Traveling Freight Agent. The office of Paymaster has been abolished.

Lake Shore & Michigan Southern.—Mr. W. L. Gilmore is appointed Master Mechanic of the Michigan Southern Division of this railway. Office and shops at Elkhart, Indiana.

Louisville & Nashville.—Mr. J. G. Metcalfe is appointed Superintendent of the Louisville, Cincinnati & Lexington Division and branches, taking effect Jan. 1, 1884.
Mr. W. P. Harris is appointed Superintendent First Division, Main Stem, and Knoxville Division, taking effect Jan. 1, 1884.
Mr. Harris has been for three years Superintendent of the Western Division of the Chesapeake & Ohio road and was at one time Superintendent of the Montclair & Greenwood Lake.

New York, Brooklyn & Sea Shore.—At the annual meeting in New York, Jan. 9, this company elected the following directors: Theodore Houston, Charles S. Braisted, William Strauss, Moritz Meyer, Charles F. MacLean, George W. Smith and Charles F. Estwick.

New York & New England.—The following order is issued by Mr. Charles P. Clark, Receiver:
"Having been appointed Receiver of the New York & New England Railroad Co. by a decree of the Circuit Court of the United States for the Second Circuit, and having qualified as such, and taken possession of all the railroads of said company in the states of Massachusetts, Connecticut, Rhode Island and New York, and of all said company's railroad franchises and property, and assumed the duties of such receiver, in accordance with said decree, the following general order is issued:
"From and after Jan. 1, 1884, the business and railroad system of the New York & New England Railroad Co. will be carried on, in all its divisions, departments and particulars, by Charles P. Clark, Receiver, with the assistance of the following organization of general officers acting under his immediate charge, namely, James W. Perkins, Assistant to Receiver; William Caleb Loring, General Solicitor; S. M. Felton, Jr., General Superintendent; G. H. Williams, General Freight Agent; A. C. Kendall, General Passenger Agent; George B Phippen, Cashier; H. M. Kochersperger, Auditor; George W. Little, Paymaster, each of whom shall have the same authority and perform the same duties respectively, under the Receiver, as the officers who held similar positions performed under the New York & New England Railroad Co., and their orders shall be obeyed as such, under the rules and regulations of the New York & New England Railroad Co., in force Dec. 31, 1883, until otherwise ordered."
The following order is issued by General Superintendent Felton:
"By direction of the Receiver the following superintendents are hereby appointed: William H. Turner, Superintendent Eastern Division; P. St. M. Andrews, Superintendent Norwich & Worcester Division; E. H. Tucker, Superintendent Woonsocket Division; E. Holbrook, Superintendent Western Division; L. W. Palmer, Superintendent Providence Division. All officers and employés other than those mentioned above will continue to perform their respective duties; and the rules and regulations of the New York & New England Railroad heretofore in force will continue until otherwise ordered."
The board has elected Mr. Eustace C. Fitz President in place of Mr. Clark, who resigns on account of his appointment as Receiver.

New York, New Haven & Hartford.—At the annual meeting in New Haven, Jan. 9, the old board was re-elected, as follows: Charles P. Clark, Newton, Mass.; Henry C. Robinson, C. M. Pond, Hartford, Conn.; George H. Watrous, E. M. Reed, E. H. Trowbridge, New Haven, Conn.; Wm. D. Bishop, Nathaniel Wheeler, Bridgeport, Conn.; Wilson G. Hunt, George N. Miller, A. R. Van Nest, Augustus Schell, Wm. H. Vanderbilt, New York.

Norfolk & Western.—Mr. Jas. C. Cassell has been appointed Train-Master, Western Divisson, taking effect Jan. 1, 1884, *vice* Mr. T. E. Reynolds, resigned.

North River Construction Co.—At the annual meeting in New York, Jan. 8, the following directors were chosen: Charles Bard, M. P. Grace, Conrad N. Jordan, Walter Katte, Thomas W. Lillie, Howard Mansfield, George G. Nevers, C. F. Smith, E. F. Winslow. This is the company which has built the New York, West Shore and Buffalo road.

New York, West Shore & Buffalo.—At the annual meeting in New York, Jan. 9, the following directors were chosen: George M. Pullman, Chicago; Peter B. McLennan, Syracuse, N. Y.; John B. Kerr, Newburg, N.Y.; Horace Porter, Long Branch. N. J.; Edward D. Adams, Frederick Billings, Elmer L. Corthell, John W. Ellis, Theodore Houston, John J McCook, Henry J. McHarg, H. Victor Newcomb, Charles F. Woerishoffer, New York.

Norwich & Worcester.—At the annual meeting, Jan. 8, the following directors were chosen: F. H. Dewey, Edward L. Davis, Thomas B. Eaton, Samuel Woodward, Josiah H. Clark, Worcester, Mass.; John F. Slater, Lorenzo Blackstone, Norwich, Conn.; William Bayard Cutting, New York; William G. Weld, Newport, R. I.; James H. Beal, Boston. Mr. F. H. Dewey was re-elected President.

Ottawa, Waddington & New York.—The directors of this new company are: James Redington, Waddington, N. Y.; Leslie W. Russell, Canton, N. Y.; James F. Pierce, Wm. Stephens, P. C. Wright, C. F. Frothingham, T. B. Alderson, C. E. Hickey, Morrisburg, Ont.; James Skead, John W. Inslay, Augustus Keefer, Ottawa, Ont.; Wm. Shanley, Montreal.

Pittsburgh, Cleveland & Toledo.—Mr. W. C. Agnew has been appointed General Superintendent of this new road; E. S. Thomas, Auditor; W. L. Hoffecker, Master Mechanic.

Postal Telegraph Co.—This company has elected the following officers: John W. Mackay, President; George S. Coe, Vice-President: Henry Cummins, Second Vice-President and General Manager; H. L. Horton, Treasurer; George R. Williamson, Secretary; William H. Fairbank, Superintendent of Construction.

Richmond & Danville.—Mr. Edmund Berkely has been appointed Superintendent of the Atlanta & Charlotte Division in place of Mr. I. Y. Sage, who has gone to the Georgia Pacific. Mr. Berkely was recently Engineer of the Northern Division of the Mobile & Ohio.

St. Louis, Crève Cœur & St. Charles.—The officers of this road are as follows: M. A. Downing, President; F. M. Colburn, Vice-President and Manager; S. H. Cobb, Secretary and Treasurer.

St. Louis, Des Moines & Northern.—This company has elected G. M. Dodge President and J. T. Granger Treasurer. The road is controlled and operated by the Wabash, St. Louis & Pacific.

St. Louis Engineers' Club.—At the annual meeting in St. Louis, Jan. 2, the following officers were chosen for the ensuing year: President, C. M. Woodward; Vice-President, Robert Moore; Secretary and Member of the Board of Managers for the *Journal*, J. B. Johnson; Treasurer, E. D. Meier.

St. Louis, Vandalia & Terre Haute.—At the annual meeting in Greenville, Ill., Jan. 8, the following directors were chosen: R. L. Dulaney, A. G. Henry, J. N. McCullough, W. R. McKeen, Abraham McNeill, Thomas D. Messler, J. S. Peers, Charles H. Seybt, Wm. Thaw. The board elected Thomas D. Messler, President; Williamson Plant, Secretary; John E. Davidson, Treasurer. The road is leased to the Terre Haute & Indianapolis.

Sinaloa & Durango.—The following appointments (some of which have been previously noted) are officially announced; Mr. H. M. Fickinger appointed General Superintendent *vice* Jas. D. Schuyler, resigned.
Mr. John E. Bell appointed Master Machinist *vice* Mr. W P. Dutton, deceased.
Mr. Frank Hawley appointed Road-Master.
All business pertaining to the company's steamship "Altata," running between Mazathan and Guaymas, touching at Altata and Agiobampo, should be addressed to H. M. Fickinger, General Superintendent, Culiacan, Mexico.

Toledo, Cincinnati & St. Louis.—Mr. Albert H. Snider is appointed Assistant General Freight Agent.

Union Pacific.—Mr. P. P. Shelby, heretofore General Freight Agent, has been appointed Freight Traffic Manager in place of Mr. E. P. Vining, resigned, and Mr. J. A. Monroe, Assistant General Freight Agent, has been promoted to be General Freight Agent.

West Virginia Central & Pittsburgh.—At the annual meeting in New York, Jan. 8, the following directors were chosen: H. G. Davis, Piedmont, W. Va.; Thomas B. Davis, Keyser, W. Va.; J. N. Camden, Parkersburg, W. Va.; A. P. Gorman, Cumberland, Md.; John A. Hambleton, Wm. Keyser, Alexander Shaw, Baltimore, Md.; Wm. H. Barnum, Lime Rock, Conn.; James G. Blaine, Augusta, Me.; S. B. Elkins, Augustus Schell, New York. The board re-elected H. G. Davis President; S. B. Elkins, Vice-President; A. Ebert, Secretary; C. M. Hoult, Treasurer.

Zanesville, McConnellsville & Pomeroy.—The officers of this new company are: President, Albert E. Boone; Vice-President and Treasurer, George M. Jewett; Secretary, Wm. S. Harlan. Office in Zanesville, Ohio.

PERSONAL.

—Mr. E. P. Fabbri has resigned his position as a director of the Oregon & Transcontinental Co., on account of an intended absence from this country.

—Mr. C. C. Baldwin, President of the Louisville & Nashville Railroad Co., has been appointed a member of the New Aqueduct Commission of New York city.

—Mr. A. B. Leet has resigned his position as General Freight and Passenger Agent of the Grand Rapids & Indiana road, to date from Jan. 1, on account of continued ill health.

—Mr. P. M. Cunningham, Superintendent of the Mt. Sterling Coal road, was killed Jan. 9 in an accident near Mt. Olive, Ky. Mr. Cunningham went from Oswego, N. Y., to take charge of the road only a few weeks ago.

—Mr. Samuel Bradford has declined a re-election, and will retire from the position of Treasurer of the Philadelphia & Reading Co., on account of advancing age and a desire for rest. He has been in the company's service for 44 years.

—Mr. Henry W. Ford, President of the Cleveland, Youngstown & Pittsburgh Co., has resigned his position as President of the Bank of the Republic in New York, in order to give his whole time to his railroad and private business.

—Judge Nelson Poe, for many years a prominent lawyer in Baltimore, died in that city, Jan. 5, aged 75 years. Judge Poe served for a number of years as a state director of the Baltimore & Ohio Co., and also as a director of the Chesapeake & Ohio Canal.

—Mr. O. H. Booth died Dec. 31 at his residence in Mansfield, O. He was for many years Superintendent of Telegraph of the lines of the Pennsylvania Company and the Pittsburgh, Cincinnati & St. Louis, and was widely known as a competent and efficient officer.

—Mr. Henry M. Witter, long President and Superintendent of the Boston, Barre & Gardner Co., has resigned the office of Superintendent, but will remain President of the company. Mr. Witter has been chosen Secretary of the State Mutual Life Assurance Co., of Worcester.

—Mr. F. T. Lerned, well known as Agent of the Baltimore Car Wheel Co., has resigned his position with that company, and entered the house of Andrews & Clooney, of New York, manufacturers of car wheels and springs. Mr. Lerned will act as General Agent of the firm, assuming entire charge of all sales, from Jan. 1.

—Mr. J. M. Boon has resigned his position as Superintendent of Motive Power of the Chicago & Northwestern road. Mr. Boon was for many years on the Pittsburgh, Fort Wayne & Chicago road, and went to the Northwestern a

little over a year ago. It is said that he has been offered a position on an Eastern road.

— The following resolutions were adopted by the directors of the Buffalo, New York & Philadelphia Co. at their last meeting:

"*Resolved*, That the board has heard with regret of the determination of Mr. J. W. Jones, President of the Buffalo, New York & Philadelphia Railroad Co., to retire from the presidency at the end of the present year of the company and not to allow the use of his name at the next election.

"*Resolved*, That it especially regrets that his state of health makes this step, in his judgment, imperatively necessary.

"*Resolved*, That during all his term of office the company has derived great advantage from his enterprise, large railroad experience and utter devotion to its interests.

"*Resolved*, That Mr. Jones carries with him in his retirement the respect and esteem of every member of the board, and the earnest hope that the rest he seeks will give him early and full restoration to health."

—At a meeting of the board of directors of the Northern Pacific Co. in New York, Jan. 4, Mr. Henry Villard presented his resignation, as follows:

"I hereby offer my resignation as President of the company and as a member of your board. I feel constrained to take this step for two reasons: One is that I am suffering from nervous prostration, which renders me no longer capable of properly discharging any official duties. My physicians advise absolute abstention from all active employment as a condition of the recovery of my health. The other reason is that, in my own opinion, no less than in that of my personal and business friends, the interests of the company call for a severance of my connection with it. It is a sad reflection that such should be the unjust result of years of severe labor and consuming anxiety which I have spent in my endeavors to serve the company conscientiously and to the best of my ability, but my feelings shall not stand in the way of the welfare of the stockholders. I am consoled by an abiding confidence that the future will completely vindicate all that I have done. I may, as soon as my health permits me, ask the privilege of submitting to you a summary of my administration of the company's affairs. Allow me to express to you, in conclusion, my sincere thanks for the cordial support and appreciative sympathy you have at all times extended to me."

In accepting this resignation the board adopted the following resolutions:

"*Resolved*, That the directors of the Northern Pacific Railroad Co., in accepting the resignation of Henry Villard, Esq., as President, beg to express to him their deep sympathy in his severe illness, their regret at the causes which have brought about his resignation, their appreciation of his great energy in pushing on the enterprise to a successful completion as a trunk line, and their sincere hope that he will soon be restored to health and prosperity.

"*Resolved*, That in view of the fact that Mr. Villard during his presidency has voluntarily received no salary whatever, that the Treasurer be directed to pay him at the rate of $10,000 a year for the period he held that office."

Mr. Villard has executed a conveyance of his real estate in New York to secure the payment of his personal indebtedness to the Oregon Railway & Navigation Co., said to be about $340,000. It is understood that he retains nothing, although his wife holds some property transferred to her a year or two ago. Mr. Villard is undoubtedly very ill at the present time, although his condition is not considered dangerous.

TRAFFIC AND EARNINGS.

Cotton.

Cotton movement for the week ending Jan. 4 is reported as follows, in bales:

Interior markets:	1884.	1883.	Inc. or Dec.	P. c.
Receipts	69,493	102,547	D. 33,054	32.1
Shipments	83,829	98,755	D. 14,926	15.1
Stock, Jan. 4	407,974	383,647	I. 24,327	6.3
Seaports:				
Receipts	140,612	224,997	D. 84,385	37.5
Exports	137,314	188,246	D. 50,932	27.1
Stock, Jan. 4	1,269,070	958,455	I. 310,515	32.4

The total receipts at interior markets for the cotton year from Sept. 1 to Jan. 4 were 2,164,537 bales, a decrease of 243,251 bales, or 10.1 per cent. The total seaport receipts for the cotton year to Jan. 4 were 3,556,962 bales, a decrease of 129,497 bales, or 3.5 per cent.

Lake Superior Iron Ore.

Total shipments of ore over the Peninsular Division of the Chicago & Northwestern road for the year 1883 are reported by the Marquette *Mining Journal* as follows:

	Tons.
Iron ore to Escanaba for shipment	1,424,299
Iron ore to furnaces by rail	60,156
Quartz	2,578
Total	1,487,033

Shipments over the Detroit, Mackinac & Marquette road for the year were as follows:

	Tons.
Iron ore to St. Ignace for shipment	61,797
Iron ore to furnaces by rail	14,773
Total	76,570

The Chicago & Northwestern carried 4,483 tons of pig iron, and the Detroit, Mackinac & Marquette 3,312 tons during the year.

Grain Movement.

For the week ending Dec. 29 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past ten years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1874	2,147,360	799,017	1,464,357
1875	2,093,225	958,855	1,630,724
1876	2,452,694	964,795	1,882,838
1877	1,528,048	1,099,339	3,561,847
1878	2,548,745	1,149,265	2,569,146
1879	4,232,089	918,954	3,114,803
1880	2,802,699	1,648,451	2,510,533
1881	2,517,143	1,629,536	1,287,007
1882	6,433,124	2,520,828	2,755,043
1883	4,488,630	1,716,100	1,546,651

Thus the receipts of the Northwestern markets in this last week of the year, though 30 per cent. less than in the corresponding week of 1882, were larger than in the corresponding week of any previous year. Last year the Northwestern receipts in this week were extraordinary, and more than a third larger than in the previous week. This year they were 662,000 bushels less than in the previous week and were the smallest since July, which is common for the last week of the year.

The shipments of these markets for the year were a third less than in the corresponding week of 1882, but larger than in any other year. Only 11,817 bushels of these shipments went down the Mississippi.

The Atlantic receipts of the week were 44 per cent. less than in 1882, and with the exception of 1881 were the smallest since 1874. They have not been so small before since the middle of April, 1882.

Exports from Atlantic ports during this week ending Dec. 29 for four successive years have been:

	1880.	1881.	1882.	1883.
Flour, bbls	186,203	65,449	244,358	100,522
Grain, bu	2,675,311	1,204,134	1,937,791	871,498

Thus the exports this year were considerably smaller than in 1881 even and not half as great as in 1880.

Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending Dec. 31:	1883.	1882.	Inc. or Dec.	P. c.
Bur., Cedar Rap. & Northern	$2,846,769	$2,800,681	I. $46,088	1.6
Canadian Pacific	5,275,534	2,536,345	I. 2,739,189	108.0
Central Iowa	1,307,103	1,165,158	I. 141,943	12.2
Chi. & Alton	8,735,929	8,215,494	I. 520,435	6.3
Chi. & East. Ill.	1,657,571	1,785,183	D. 127,612	7.1
C. & Gd. Trunk	2,945,358	2,274,268	I. 671,090	29.5
C., M. & St. Paul	23,660,000	20,386,718	I. 3,273,282	16.1
Chi. & Northwest	25,572,364	24,662,467	I. 909,897	3.7
Chi. & West Mich.	1,543,839	1,500,197	I. 43,642	2.9
C., St. P., M. & O.	5,502,987	5,085,300	I. 507,687	9.9
Cin., Ind., St. L. & Chicago	2,496,347	2,576,103	D. 79,756	3.1
E. T., Va. & Ga.	4,140,318	3,443,701	I. 696,617	20.2
Denver & R. G.	7,387,500	6,349,199	I. 1,038,301	16.4
Evans. & T. H.	723,894	850,230	D. 126,336	14.9
Ind., B. & West.	2,918,749	2,740,227	I. 178,522	6.5
Lake S. & M. So.	18,550,000	18,225,639	I. 324,361	1.8
Long Island	2,689,200	2,479,446	I. 209,754	8.5
Louisville & Nash.	14,140,224	12,668,665	I. 1,461,559	11.5
Michigan Central	14,000,000	8,913,081	I. 5,086,919	57.1
M., Lake Sh. & W.	1,023,473	869,853	I. 153,620	17.7
Mo. Pacific	17,107,441	15,676,827	I. 1,430,614	9.1
Central Branch	1,522,040	996,495	I. 525,545	52.8
Mo., Kan. & T.	11,658,994	10,138,462	I. 1,520,532	14.9
Texas & Pacific	7,005,111	5,919,733	I. 1,085,378	18.3
Mobile & Ohio	2,264,425	2,185,167	I. 79,258	3.6
Ohio Southern	415,141	385,864	I. 29,277	7.6
Or. Ry. & Nav.	5,565,321	5,040,915	I. 524,406	10.4
Net earnings	2,639,535	2,448,459	I. 191,076	7.8
Peoria, Dec. & E.	720,886	763,529	D. 42,643	5.6
Rich. & Danville	3,842,012	3,663,384	I. 178,628	4.9
St. L. & San Fran	3,903,000	3,581,800	I. 321,200	8.9
St. P. & Duluth	1,325,015	1,109,841	I. 215,174	19.4
St. P. M. & Man.	8,394,601	8,764,162	D. 369,561	4.2
Wab., St. L. & P.	16,908,463	16,738,358	I. 170,105	1.0
Eleven months ending Nov. 30:				
A., Top. & S. F.	$13,011,531	$13,314,666	D. $303,135	2.3
Net earnings	7,110,458	5,743,473	I. 1,366,985	23.7
Ches. & Ohio	3,600,407	3,081,621	I. 518,786	16.8
Net earnings	1,258,386	865,180	I. 293,206	30.4
Chi., Bur. & Q.	23,939,451	19,523,745	I. 4,415,706	22.6
Net earnings	12,157,949	9,622,046	I. 2,535,903	26.4
E., L. & B. S.	661,573	482,229	I. 179,344	57.2
Net earnings	205,554	152,000	I. 53,554	35.3
Northern Central	5,678,979	5,310,173	I. 368,806	6.9
Net earnings	2,257,145	1,949,165	I. 307,980	15.9
Phila. & Reading	28,002,556	20,039,228	I. 7,963,328	39.6
Net earnings	13,708,864	8,988,455	I. 4,720,409	52.6
P. & R. C. & I. Co.	15,968,730	13,629,256	I. 2,339,474	17.2
Net earnings	916,597	1,133,242	D. 216,645	19.1
Southern Kansas	1,585,170	1,208,153	I. 377,017	31.2
Net earnings	870,433	652,216	I. 108,217	33.5
Union Pacific	27,353,779	27,804,921	D. 451,142	1.6
Net earnings	12,414,496	13,108,193	D. 693,697	5.3
Month of November:				
A., T. & S. F.	$1,340,762	$1,349,312	D. $8,550	0.6
Net earnings	779,708	726,879	I. 52,829	7.3
Ches. & Ohio	345,305	300,732	I. 44,573	14.8
Net earnings	132,059	96,640	I. 35,419	36.5
C., Bur. & Q.	2,562,773	2,199,421	I. 363,352	16.5
Net earnings	1,488,004	1,330,802	I. 157,202	11.8
E., L. & B. S.	58,051	61,188	D. 3,137	5.1
Net earnings	13,350	20,933	D. 7,573	36.2
Northern Central	536,094	526,685	I. 9,409	1.8
Net earnings	165,707	148,230	I. 17,477	11.8
Oregon Imp. Co.	384,247	340,058	I. 44,189	13.0
Net earnings	152,738	90,554	I. 62,184	68.6
Phila. & Reading	3,654,916	2,256,750	I. 1,398,166	62.0
Net earnings	2,073,481	1,104,564	I. 968,917	87.7
P. & R. C. & I. Co.	1,750,585	1,257,791	I. 498,794	39.7
Net earnings	393,205	303,122	I. 90,083	29.9
Southern Kansas	195,512	152,835	I. 42,671	27.9
Net earnings	122,908	90,741	I. 32,167	35.4
Union Pacific	2,731,722	2,711,916	I. 19,806	0.7
Net earnings	1,022,838	1,021,055	I. 1,783	0.2
Month of December:				
Bur., Cedar Rap. & Northern	$261,206	$246,061	I. $15,145	6.2
Canadian Pacific	314,000	231,000	I. 83,000	35.9
Central Iowa	118,237	102,229	I. 16,008	15.7
Chi. & Alton	732,104	701,064	I. 31,040	4.4
Chi. & East. Ill.	141,289	140,458	I. 831	0.6
Chi. & Gd. Trunk	243,617	229,742	I. 13,875	6.0
C., Mil. & St. Paul	2,151,000	1,964,707	I. 186,293	9.5
Chi. & Northwest	1,806,600	1,826,900	D. 20,300	1.1
C., St. P., M. & O.	444,000	380,700	I. 63,300	16.6
Cin., Ind., St. L. & Chicago	186,579	190,564	D. 3,985	2.1
Denver & Rio G.	580,450	443,000	I. 137,450	31.0
E. Tenn., Va. & G.	367,834	333,686	I. 34,148	10.2
Evansville & T. H.	59,976	59,982	D. 6	....
Ft. W. & Denver	29,600	28,247	I. 1,353	4.8
Ind., Bl. & West.	235,000	205,211	I. 29,789	14.5
Long Island	153,348	156,980	D. 3,632	2.3
Louisville & Nash	1,232,000	1,221,555	I. 11,345	0.9
Mil., L. Sh. & W.	79,465	76,585	I. 2,880	3.7
Mo. Pacific	1,561,380	1,574,973	D. 13,593	0.9
Central Branch	154,108	120,576	I. 33,532	27.7
Mo., K. & Tex.	1,058,985	1,098,577	D. 39,592	3.6
Tex. & Pacific	1,259,718	1,320,144	D. 60,426	4.6
Mobile & Ohio	296,029	306,720	D. 10,691	3.5
Ohio Southern	33,979	39,156	D. 5,177	13.3
Or. Ry. & Nav.	427,500	280,650	I. 146,850	52.3
Net earnings	156,000	67,769	I. 88,231	130.2
Peoria, Dec. & E.	62,580	55,655	I. 6,925	12.4
Rich. & Danville	331,500	322,400	I. 9,100	2.9
Rochester & Pitts.	91,178	28,000	I. 63,178	225.6
St. L. & San Fran	421,000	339,300	I. 81,700	24.0
St. P. & Duluth	94,904	92,873	I. 2,031	2.2
St. P., M. & M.	699,480	753,515	D. 54,035	7.2
Wab., St. L. & P.	1,518,286	1,331,953	I. 186,333	14.0

Early reports of earnings are in general partly estimated, and are subject to correction by later statements.

Coal.

Anthracite coal tonnages, as given in the weekly reports, were as follows for the year ending Dec. 31, the tonnage in each case being only that originating on the line to which it is credited:

	1883.	1882.	Inc. or Dec.	P. c.
Phila. & Reading	12,100,010	11,601,762	I. 498,248	4.3
Shamokin & Summit Br.	1,219,854	1,238,842	D. 18,988	1.5
Sun., Hazleton & W. B.	169,146	166,417	I. 2,729	1.6
North & West Branch	516,800	.....	I. 516,800	....
Pennsylvania Canal	486,663	529,026	D. 42,363	8.0
Lehigh Valley	6,372,929	6,009,084	I. 363,845	6.1
Pennsylvania & N. Y.	214,492	194,680	I. 19,812	10.2
Del., Lacka. & Western	5,011,408	4,595,518	I. 415,890	9.0
Del. & Hud. Canal Co.	3,975,630	3,581,973	I. 393,657	11.1
Pennsylvania Coal Co.	1,481,682	1,438,821	I. 42,861	3.0
State Line & Sullivan	68,495	64,925	I. 3,570	5.5
Total anthracite	31,617,109	29,421,048	I. 2,196,061	7.5

The Jersey Central tonnage is included with the Reading in both years. The North & West Branch road was not opened in 1882.

The total anthracite tonnage for the year, as given by these weekly reports, has been as follows for eight years past:

	Tons.		Tons.
1883	31,617,109	1879	25,769,385
1882	29,421,048	1878	17,127,681
1881	27,991,164	1877	20,134,739
1880	23,096,111	1876	18,105,339

As has been before noted, these reports are compiled from various sources as giving indications of the division and direction of the trade in more detail than the Official Accountant's statement; the latter, however, is the only reliable and accurate statement as to the total amount of the anthracite output.

The semi-bituminous tonnages reported for the year are as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Cumberland, all lines	2,482,200	1,522,980	I. 959,220	63.0
Huntingdon & Broad Top	190,817	271,217	D. 80,400	29.6
East Broad Top	42,708	92,519	D. 49,811	53.9
Clearfield Region, P. R. R	2,836,362	2,789,165	I. 47,197	1.7
Bellefonte & Snow Shoe	256,915	232,698	I. 24,217	10.4
Total semi-bituminous	5,809,002	4,908,579	I. 900,423	18.3

The great increase in Cumberland shipments has not prevented a gain in other regions, except in the case of the Broad Top coals, the output of which in 1882 was greatly stimulated by the scarcity of Cumberland during the long strike. During nearly all of 1883 a sharp competition and low prices prevailed.

Bituminous coal tonnages for the year are reported as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Barclay R. R. & Coal Co.	327,916	397,314	D. 69,398	17.5
Mountain Region, Pa. R. R.	456,444	527,768	D. 71,324	13.5
Penn and Westmoreland	1,388,938	1,274,116	I. 114,822	9.0
West Penna. R. R.	387,770	368,124	I. 19,646	5.3
Southwest Penna. R. R	123,430	112,685	I. 10,745	9.5
Pittsburgh Region, Pa. R. R.	601,972	646,348	D. 44,376	6.9
Total bituminous	3,286,470	3,326,355	D. 39,885	1.2

The bituminous coal regions have held their own quite as well as might have been expected, considering the decreased demand from the iron trade, upon which several of them largely depend for a market.

Coke tonnages for the year are reported as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Bellefonte & Snow Shoe	18,624	20,934	D. 2,310	11.1
Mountain Region, Pa. RR.	82,814	110,356	D. 27,542	25.0
Penn and Westmoreland	217,880	267,406	D. 49,526	18.5
West Penna. R. R.	121,841	117,945	I. 3,896	3.3
Southwest Penna. R. R.	2,083,365	1,805,362	I. 278,003	15.4
Connellsville & Pittsburgh (Pa. R. R.)	588,863	566,784	I. 22,079	3.9
Total coke	3,113,387	2,888,787	I. 224,600	7.8

These tonnages are all over the Pennsylvania Railroad and its branches. The figures for this year are to Dec. 29, but the shipments foo the remaining two days of the year were very small.

The anthracite coal tonnage passing over the Belvidere Division, Pennsylvania Railroad, for the year ending Dec. 31 was as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Coal Port for shipment	126,113	101,786	I. 24,327	24.1
S. Amboy for shipment	595,807	730,957	D. 135,150	18.5
Local points on N. J. divs	821,971	778,407	I. 43,564	5.6
Co.'s use on N. J. divs	163,739	133,473	I. 30,266	22.7
Total	1,707,630	1,744,623	D. 36,993	2.1

Of the total in 1883 there were 1,389,507 tons from the Lehigh Region, and 318,123 tons from the Wyoming Region, against 1,452,906 tons Lehigh and 291,717 tons Wyoming coal in 1882.

Cumberland coal tonnage for the year ending Dec. 31 is reported by the Cumberland *Civilian* as follows:

Shipments from Mines:	Tons.
Cumberland & Pennsylvania R. R.	1,623,915
George's Creek & Cumberland R. R.	494,651
West Virginia Central & Pittsburgh R. R.	329,937
Direct from mines to Baltimore & Ohio	33,697
Total	2,482,200
Shipments out of region:	
Baltimore & Ohio (including local tonnage)	1,382,009
Pennsylvania R. R., Bedford Division	418,966
Chesapeake & Ohio Canal	681,225
Total	2,482,200

The total tonnage in 1882 was 1,522,980, showing an increase last year of 959,220 tons, or 63.0 per cent. The mines were nearly all idle from March 15 to Sept. 1, 1882, on account of the miners' strike.

Actual tonnage passing over the Huntingdon & Broad Top Mountain for the year was as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Broad Top coal	190,817	271,217	D. 80,400	29.6
Cumberland coal	477,502	208,031	I. 269,471	129.6
Total	668,319	479,248	I. 189,071	39.5

The Broad Top coal is mined on the line; the Cumberland is carried through from Mt. Dallas to Huntingdon for the Pennsylvania Railroad.

Actual tonnage passing over the Pennsylvania & New York road for December, the first month of its fiscal year, was:

	1883.	1882.	Inc. or Dec.	P. c.
Anthracite	72,720	83,805	D. 11,085	13.2
Bituminous	29,864	32,858	D. 2,994	9.1
Total	102,584	116,663	D. 14,079	12.0

The larger part of the anthracite is received from the Lehigh Valley road, of which this line is an extension.

The coal tonnage of the Delaware, Lackawanna & Western road for the year ending Dec. 31 was as follows:

	1883.	1882.	Inc.	P. c.
Shipped south and east	2,798,802	2,542,014	256,788	10.1
Shipped north and west	2,212,605	2,053,504	159,101	7.8
Total	5,011,407	4,595,518	415,889	9.0

The shipments north and west do not show the greater proportionate increase which was expected this year.

The coal tonnage of the Pennsylvania Coal Co. for the year was as follows:

	1883.	1882.	Inc. or dec.	P. c.
West by N. Y., Lake Erie & Western	230,979	209,837	I. 21,142	10.1
East by N. Y., Lake Erie & Western	1,248,765	1,221,024	I. 27,741	2.3
East by Del. & Hud. Can.	1,939	7,960	D. 6,021	75.6
Total	1,481,683	1,438,821	I. 42,862	3.0

This company does a very steady trade and its shipments show less fluctuation than those of any of the other anthracite companies.

Cumberland coal shipments for the week ending Jan. 5 (five days), were 22,387 tons.

East-Bound Rates.

The following order was last week issued by Commissioner Fink for reasons explained in the circular:

"From information received at this office, it appears that, while there is a general disposition of all roads represented

on the Joint Executive Committee to maintain rates, the rates are not maintained, the reason for which may be in the imperfect control over outside lines and general want of confidence. Under the action of the Standing Committee I am obliged to notify you of a reduction of rates on eighth class to the basis of 20 cents per 100 pounds (Chicago to New York); seventh class to the basis of 25 cents per 100 pounds; ninth class to 30 cents, and on hogs 25 cents, to take effect on Saturday, Jan. 5, and to be in force only until proper arrangements can be made for the restoration and permanent maintenance of an established tariff."

A meeting of the Joint Executive Committee is called for Thursday, Jan. 10, in New York, to inquire into the causes of the present unsettled condition of rates, and with the view of restoring the tariff, if found practicable, under the rules of the Committee, in case temporary reductions are made to meet cut rates. The established tariff will be restored as soon as authorized reductions are discontinued, without 10 days' previous notice, and for this reason engagements for carrying for carrying freight under the reduced tariff must only be made from day to day. The reduction is 10 cents per 100 pounds.

Transcontinental Traffic Association.

A dispatch from Chicago, Jan. 9, says: "A meeting of the roads interested in the Transcontinental Association was held here to day. The lines represented were the Union Pacific; Central Pacific; Atchison, Topeka & Santa Fe; Denver & Rio Grande; Burlington & Missouri; Northern Pacific; Texas & Pacific; Southern Pacific, and Galveston, Harrisburg & San Antonio railroads. The Union Pacific desired immediate action on the proposition to extend the territory of the Association east to Chicago, and a resolution was submitted inviting the Chicago and Missouri River roads to participate in the conference. The Burlington announced that it was ready to act and would vote against the proposed extension, but the other roads preferred to delay action until to morrow. S. H. H. Clark, the Union Pacific representative, refused to waste time over the consideration of rules and regulations until the question of territory should be settled, and accordingly withdrew from the meeting, leaving his road to be represented by the General Freight Agent only. But little was done beyond the consideration of the rules and regulations, and even this made little progress. The indications still point strongly to a dissolution of the Transcontinental Association, in accordance with the prevailing disposition to merge all the pools into the new Western Trunk Line Association."

The Trunk Lines and the Lackawanna.

Commissioner Fink has issued a circular directing that, from Jan. 14, the roads represented in the Joint Executive Committee refuse to exchange through business with the Delaware, Lackawanna & Western, or to be parties to any through bills of lading over that line.

RAILROAD LAW.

Refusal to Receive Frieght.

In Dawson against the Chicago & Alton Co. the Missouri Supreme Court recently held as follows:

When, by an accident upon another railroad, a company has an extraordinary amount of freight thrown upon it, if it possesses all the facilities requisite for the transaction of its ordinary volume of business, it is justified in refusing to receive freight, except on the condition that it shall not be liable for delays.

Liability for Injury to Stock.

In Hazelle against the Hannibal & St. Joseph Co. the Missouri Supreme Court recently decided as follows:

1. After verdict it is too late to contend that a petition which alleges that "the plantiff's cattle came upon the track of said road at a place on said road where there was no public or private crossing, and where said road was not fenced" is insufficient, because it does not appear that the cattle were not killed in a city, town or village.

2. Where the tracks of two railroad corporations run parallel to a highway where the plaintiff's cattle were running at large, both companies are liable for an injury to stock, caused by neglect to maintain a proper fence.

Refusal to Stop a Train—Damages.

In Marshall against Railroad Co., the Missouri Supreme Court has just decided as follows:

Where the plaintiff purchased at A a ticket to B, the ticket agent assuring him that the train would stop at B, but the conductor of the train, which was a through express to C, refused to stop at B, but carried her through to C, and she was there obliged to procure a carriage for B, and upon her arrival found her daughter, whom she came to see, dead, the company is responsible for the mistake or misdirection of the station-master, and not for the refusal of the conductor. The measure of damages is the sum paid to return to B, the value of her time and the inconvenience she suffered. Judgment for $750 was for excessive damages.

Discrimination in Rates.

A dispatch from Cleveland, O., Jan. 8, says: "In the suit of Schofield, Schermer & Teagle, of Cleveland, oil refiners, against the Lake Shore & Michigan Southern Co. for an injunction restraining the defendant from discriminating against the plaintiffs and in favor of the Standard Oil Co., in the matter of freights on refined oil, the relief prayed for was granted, Judge Blandin saying in his decision that a railroad was a common carrier, and on account of exercising the right of eminent domain was under even greater obligations than common carriers. A railroad has no right, he says, to make secret rates in favor of a corporation to the disadvantage of the public. The plea set up by the railroad that on account of large shipments a better rate could be made, was no longer an excuse and could not be allowed, as it prevented competition and fostered monopolies. The railroad company took an appeal, bond being fixed at $1,000. This case has been watched with great interest by oil refiners in all parts of the country, as it was considered a test of the question, and hundreds of similar suits will probably be entered against the railroads on the same grounds."

OLD AND NEW ROADS.

Atchison, Topeka & Santa Fe.—This company makes the following statement for November and the eleven months ending Nov. 30:

	November.		Eleven months.	
	1883.	1882.	1883.	1882.
Earnings	$1,34 ,762	$1,349,312	$13,011,531	$13,314,666
Expenses	561,054	622,433	5,90 ,073	7,571,193
Net earnings	$779,708	$726,879	$7,110,458	$5,743,473
Per cent. of exps.	41.8	46.1	45.3	56.9

For the eleven months this shows a decrease of $303.135, or 2.3 per cent., in gross earnings, with a decrease of $1,670,120, or 22.1 per cent., in expenses, the result being an increase of $1,366,985, or 23.7 per cent., in net earnings. For November the mileage worked was 1,820 miles in both years; for the eleven months it was 1,820 miles in 1883 and 1,815 in 1882.

For the controlled Southern Kansas road the statement is as follows, the mileage for November being 398 miles in both years, and for the eleven months 398 miles in 1883 and 393 in 1882:

	November.		Eleven months.	
	1883.	1882.	1883.	1882.
Earnings	$195,512	$152,835	$1,585,170	$1,208.153
Expenses	72,604	62,094	714,737	555,937
Net earnings	$122,908	$90,741	$870,433	$652,216
Per c't. of exp's.	37.1	40.6	45.8	46.0

For the eleven months this shows an increase of $377,017, or 31.2 per cent., in gross earnings, with an increase of $158,880, or 1.3 per cent., in expenses; the result being a gain in net earnings of $218,217, or 33.5 per cent.

This company has decided to erect four hospital buildings for the use of its employés when sick or injured. One will be located at Topeka, Kan.; one at Dodge City, Kan.; one at Raton, N. M., and the fourth probably at Socorro, N. M., although this has not yet been fully decided. The buildings and furniture will cost about $25,000 each.

Atlantic & Pacific.—The Boston *Advertiser* of Jan. 4 says: "The Atlantic & Pacific Railway temporary settlement between the Atchison, St. Louis & San Francisco companies has been formally ratified by both corporations. It is understood that the vote in the St. Louis & San Francisco Railroad board stood six to seven in favor of the Atchison and Seligman plan against Messrs. Gould & Huntington. By the settlement the Atchison and San Francisco companies advance each $200,000 and the syndicate $200,000 more to the Atlantic & Pacific Co., and take security upon proceeds of land sales now in negotiation."

Chesapeake & Ohio.—This company makes the following statement for November and the eleven months ending Nov. 30:

	November.		Eleven months.	
	1883.	1882.	1883.	1882.
Earnings	$345,305	$300,732	$3,600,407	$3,081,621
Expenses	213,246	204,0 2	2,342,021	2,116,441
Net earnings	$132,059	$96,640	$1,258,386	$965.180
Per cent. of exp's.	61.8	67.9	65.1	68.7

For the eleven months there was an increase in gross earnings of $518,786, or 16.8 per cent.; an increase in expenses of $225.580, or 10.7 per cent., and a resulting gain in net earnings of $293,206, or 30.4 per cent.

For the western extension of the road, the leased Elizabethtown, Lexington & Big Sandy road, the following statement is made:

	November.		Eleven months.	
	1883.	1882.	1883.	1882.
Earnings	$58,051	$61,188	$661,573	$482,229
Expenses	44,691	40,255	456,019	330,229
Net earnings	$13,360	$20,933	$205,554	$152.000
Per cent. of expenses	77 1	65 8	68.9	68.5

For the eleven months this shows an increase of $179,344, or 37.2 per cent., in gross earnings, with an increase of $125,790, or 38.1 per cent., in expenses, the result being a gain in net earnings of $53,554, or 35.3 per cent.

Chicago, Burlington & Quincy.—On the branch from Kenesaw, Neb., southwest the track is now laid to Holdredge, in Phelps County, a distance of 39 miles from the junction with the Burlington & Missouri River main line. This line is to be extended some 22 miles further to the Republican Valley line near Oxford, forming the cut-off for the Denver line which has been heretofore referred to.

This company's statement for November and the eleven months ending Nov. 30 is as follows:

	November.		Eleven months.	
	1883.	1882.	1883.	1882.
Earnings	$2,562,773	$2,199,421	$23,939,451	$19.523,745
Expenses	1,074,709	864,559	11,781,502	9.901,699
Net earnings	$1,488,334	$1,330,862	$12,157,949	$9,622.046
P. c. of exps.	41.9	39.5	49.2	50.7

For the eleven months there was an increase of $4,415,706, or 22.6 per cent., in gross earnings, with an increase of $1,879,803, or 19.0 per cent., in expenses, the result being the very large gain in net earnings of $2,535,903, or 26.4 per cent.

Chicago Lake Front.—A dispatch from Chicago, Jan. 7, says: "At a meeting of the City Council to-night the Mayor presented a communication to the effect that he had, in accordance with the Council order a year or more ago, completed negotiations for the sale to the Illinois Central and Michigan Central roads, for station and other railway purposes, all that portion of the lake front between Randolph and Monroe streets east of the east line of Michigan avenue and to within one inch of the lake shore, with the provision that this inch be leased at a nominal sum to the roads for 999 years, with the privilege of renewal for $800,000. This matter has been in an unsettled state for about 20 years, and has been appealed to the United States courts and Congress. It was claimed that the sale of this property would give the roads a complete monopoly of the lake commerce of Chicago as soon as the government harbor was completed and the pier erected. The sale has remained in abeyance under an injunction issued from the United States Court. The recent death of the Hon. Thomas Hoyne, who was killed in a railway accident near Rochester, removed the last objector to the dissolution of the injunction."

Chicago, St. Louis & Western.—The Chicago, Pekin & Southwestern road, which was sold under foreclosure of second mortgage nearly two years ago, has been ordered by the Court to be conveyed to this company, which has been organized by the purchasing bondholders, to take and operate it.

Chicago & West Michigan.—This company's Newaygo Division is now completed and opened for business to Baldwin, Mich., 13 miles northward from the late terminus at West Troy, and 74 miles from Grand Rapids.

Eastern Shore.—The Baltimore *Day* says: "It is understood from reliable authority that the Eastern Shore Railroad has been sold to the Pennsylvania Railroad Co. For several months past negotiations between the two companies have been on the tapis, but the sale was not finally consummated until a day or two ago. The demands of the stockholders of the Eastern Shore Railroad were excessive, and the Pennsylvania only yielded to the payment of an increase on its original offer at the last moment. The amount is approximated at $450,000, the total value of the bonds being held at $405,000. Yesterday the Pennsylvania assumed control and management of the line. The proposed route from Delmar to Pocomoke City will be abandoned in consequence of the purchased road forming a connection between these two points. The line from Pocomoke City to Cherrystone, Va., will rapidly be pushed forward, and steamers will ply daily between Norfolk and the latter point. The possible changes to be made in the management of the road are not yet made public."

The road extends from Delmar, the terminus of the Delaware road, to Crisfield, 38 miles.

Georgetown & Lanes.—This road is now completed and opened for business from Georgetown, N. C., westward 37 miles to Lanes, the junction of the Northeastern and the South Carolina Central roads. The road has been built and equipped by Mr. A. J. Twiggs, of Augusta, Ga., as contractor.

Grand Rapids & Indiana.—The following circular from the office of the General Freight Agent is dated Grand Rapids, Mich., Dec. 31, 1883:

"Our Manistee Branch having been extended from Deer Lake to Raiguel, you are hereby notified that freight can now be received for the following named points: Foxville, Mich., distance from Deer Lake, 4.2 miles; Raiguel, 7.2 miles.

"No agents having been appointed, all freight and charges billed to points named must be prepaid. Rates to and from Foxville will be the same as to and from Deer Lake, and rates to and from Raiguel will be the same as to and from Luther."

Grand Trunk.—On the morning of Jan. 2 there was a butting collision between a suburban passenger train and a freight train on the Grand Trunk road in Toronto, Ont. The passenger train was drawn by a light engine and chiefly filled with workmen going to the iron works at Humber; it consisted of three passenger cars without a baggage car. The collision took place on a curve and the shock was so great that the first passenger car was completely wrecked, the heavy freight engine forcing the light engine into it and tearing it to pieces. The boiler of the passenger engine also exploded, or was torn open by the shock, filling the wrecked car with steam. The fireman of the freight and 14 passengers were killed; 12 others were so hurt that they have since died, and 15 more were badly hurt. The dispatches indicate that all of those who were killed or hurt were in the first car. The conductor and engineer of the freight had orders to avoid all regular trains, but did not, it is said, notice the local train on the time-table. They were arrested and held pending an examination, which is now in progress.

Hot Springs.—A correspondent desires us to correct a report which has found currency in some of the papers to the effect that this road was now controlled by the Missouri Pacific Co. The road is owned entirely by Mr. Jo. Reynolds, of Chicago, and is operated by him under the organization of the company. It is of 3 ft. gauge and 25 miles long, from Malvern, Ark., to Hot Springs. Six miles of the track have been relaid with 52-lb. steel rails. It is equipped with 3 locomotives, 5 passenger and 2 baggage cars, 18 box and 12 flat cars.

Inter-State Railway & Transfer Co.—This company has filed articles of incorporation in Illinois. The incorporators are: E. B. Guthrie, Secretary of the Chicago & Atlantic Railway; George M. Beach, J. B. Farley, James Wilson and V. D. Becker, all Chicago men. The road will run from South Chicago southeasterly to the town of Thornton, in such a way as to let other roads, not now running to South Chicago, gain access to the Calumet River front, in the immediate vicinity of Ninety-second street. It will cross the Pennsylvania & Lake Shore tracks at about Colehour, and run south through what is known as Indian Ridge.

This route will be a sort of belt-line, and will enable the Chicago & Atlantic, the Louisville, New Albany & Chicago, and the Nickel-plate roads to use the docks (to be) on the east side of the Calumet River between Ninety-second and Ninety-fifth streets.

Lac la Belle & Calumet.—This road was last year completed from Lac la Belle, in Keweenaw County, Mich., to the Delaware Mine, a distance of 7.6 miles. It is of 3 ft. gauge, and was built by the Conglomerate Mining Company.

Lehigh Valley.—This company issued the following notice on Jan. 8:

"Stockholders are hereby notified that they will be entitled to subscribe for additional stock at par, in the proportion of one share for every five shares standing to their credit at the closing of the books at 3 p. m. this day, payable in five instalments of $10 each, the first payment to be made between Jan. 16 and Feb. 15, 1884, after which date no subscriptions will be received. The subsequent instalments will be due and payable during the months of April, July and October, 1884, and January, 1885, but they may be anticipated at any installment period.

"Scrip certificates will be issued in acknowledgment of the payments, which certificates will bear interest as follows: Two months interest at the rate of 5 per cent. per annum, will be paid on April 15, and three months interest at the same rate, on July 15 and Oct. 15, 1884, and Jan. 15, 1885. At the last named date interest will cease, and the scrip will become convertible into the common stock of the company.

"Receipts will be given for fractional parts of shares, but payment for such fractions must be made in full at the time of subscription. These fractional receipts will not be entitled to either interest or dividends, but when presented in even shares will be convertible into scrip receipts for full paid shares; which receipts will be similar to and subject to the same conditions as those provided for the subscription to full shares."

The stock of the company is $27,603,150, so that the new issue will amount to $5,520,630, making the total amount $33 123,780. The proceeds of the new stock are to be used to pay $1,300.000 sterling bonds redeemed, and to pay for the extension of terminal and coal shipping facilities at Buffalo and for other improvements of the road.

As the stock was quoted in Philadelphia on Tuesday at $71 to $72 per share of $50 par value, the option of taking one share at par for each five shares now held is equivalent to a dividend of about 8¾ per cent. to the stockholders.

Little Rock, Mississippi River & Texas.—The Boston *Herald* of Jan. 3 says: "This company is paying the interest on its scrip, and gives notice that scrip will be issued for the coupons due on the first and second-mortgage bonds maturing July 1, 1882, to and including Jan. 1, 1885, covering coupons numbered 13 to 18 inclusive of the first-mortgage bonds, and numbers 3 to 7 inclusive of the second mortgage bonds. Said scrip to be payable in five years from date of coupons, with interest at 7 per cent. per annum, payable semi-annually."

Louisville, New Orleans & Texas.—The tracklayers working from Memphis southward have reached Magnolia, Miss., 57 miles southward from Memphis. The grading is substantially finished to Clarksdale, 20 miles further. Work on the bridge over the Sunflower River at that point is progressing well, and a considerable force is employed on the heavy fills between the Sunflower and Hushpuckana rivers and on the bridging.

Manchester & Keene.—In the suit brought by Bruce and others to set aside the sale of this road under foreclosure, the United States Circuit Court has decided that the bill

cannot be maintained, and has dismissed the suit. This decision upholds the validity of the foreclosure, and confirms the title to the property in the Boston & Lowell Co., which is the present owner.

Minnesota & Northwestern.—This company, which was last week granted the right of way into St. Paul, Minn., is to build the northern end of the projected new line up the Mississippi from Dubuque or Galena to St. Paul. A St. Paul dispatch says that the company is controlled by the Illinois Central, but the officers of that company say that they have no connection with the new line.

Montgomery Southern.—A dispatch from Montgomery, Ala., Jan. 1, says: "At a meeting of this company's bondholders, they instructed their trustee, Joshua Morris, to offer said road for sale by giving public notice thereof. The road is but a few years old. It is a narrow-gauge, and has been running 23 miles through Montgomery County toward Crenshaw and Pike counties, in the best cotton region in the country. Want of means to extend it as contemplated is the cause of to-day's action of the bondholders. Several parties will compete for the purchase when sold."

New York & New England.—The following circular was issued Jan. 1 by Mr. Charles P. Clark, addressed to all agents, officers and employés of the New York & New England Railroad Co., and to whom it may concern:

"The undersigned, having been appointed Receiver of the New York & New England Railroad Co., by the Circuit Court of the United States for the Second Circut, hereby gives notice that he has qualified as such and has taken possession as such, of all the railroads of said company in the states of Massachusetts, Connecticut, Rhode Island and New York, and of all said company's railroad franchises and property."

A suit has been begun in the United States Circuit Court in New York by Mr. Brassey, a second-mortgage bondholder, in whose name the proceedings in Connecticut were had. The suit is concurrent with the Connecticut proceedings, and is intended only to extend the action there into the jurisdiction of the New York circuit.

A meeting of the board was held in Boston, Jan. 7, 12 members being present. Mr. C. P. Clark, Receiver, presented his resignation as President and Mr. Eustace C. Fitz was chosen in his stead. Letters were read from absent members of the board, in which all but one approved of the action taken at Hartford on New Year's eve.

The following resolutions were unanimously adopted:

"*Resolved*, That in view of existing facts it is the unanimous opinion of the board that immediate application be made to the legislatures of the states of Massachusetts, Connecticut and Rhode Island for leave to issue the present unissued second-mortgage bonds of the company for the purpose of paying the floating debt of the company and for any other purpose for which the company may legally incur a debt: and that to enable the said application to be made and while the same is pending, and arrangements are in progress for negotiating said bonds, it is desirable that the existing receivership be continued in force.

"*Resolved*, That in the opinion of this board it may be reasonably expected that the proposed measures be taken and the credit of the corporation re-established and the receivership terminated within four months from this date."

It was also voted that Messrs. Fitz, Higginson, French, Metcalf and Kingsbury be a committee of the board to present and urge the needful measures before the legislatures of the several states.

It was also voted that in the opinion of the board the welfare of the property demanded the immediate completion of the double track to Willimantic, and measures to insure its completion early in the spring should be taken.

It was also the opinion of the board that the floating debt should be paid at once through the receivership, if the consent of the Court can be obtained, and pending legislative consent to the use of the second-mortgage bonds for the purpose. It is said that arrangements are in progress which will result in the money being forthcoming.

The above action was taken after consultation with the counsel of the opposing interests, and everything was done harmoniously. Pending the carrying out of the above propositions, the proposed proceedings before Judge Shipman will probably be held in abeyance. A detailed statement will be sent to stockholders, giving the condition of the road on Dec. 31.

New York, New Haven & Hartford.—At the annual meeting in New Haven, Jan. 9, Mr. Goodwin, of East Hartford, presented a resolution instructing the board to bring suit against the directors who voted to buy the controlling interest in the New Haven & Northampton road to recover the amount paid for that stock. The resolution was rejected, Mr. Goodwin alone voting for it.

Northern Central.—This company makes the following statement for November and the eleven months ending Nov. 30:

	—November.—		—Eleven months.—	
	1883.	1882.	1883.	1882.
Earnings	$536,094	$528,685	$5,678,979	$5,310,173
Working exps	276,039	317,252	3,051,853	3,041,160
Extraordinary exps.	94,348	61,203	389,981	339,848
Total exps	$370,387	$378,455	$3,441,834	$3,381,008
Net earnings	$165,707	$148,230	$2,237,145	$1,929,165
Per cent. of exps.	69.3	71.7	61.0	63.7

This shows for the eleven months an increase of $368,806, or 6.9 per cent., in gross earnings; an increase of $10,693, or 0 3 per cent. in working expenses and of $50,133, or 14.7 per cent., in extraordinary expenses, making an increase of $60,826, or 1.8 per cent., in total expenses; the result being a gain in net eornings of $307,980, or 15.9 per cent.

Northern Pacific.—At a meeting of the board held in New York, Jan. 4, the resignation of Mr. Henry Villard as President was presented and accepted. The board then appointed a special committee, consisting of Messrs. Morgan, Billings, Cheney, Belmont, Harris and Bullitt, to consider what action should be taken by the board on the President's retirement; also what course to pursue in relation to the selection of a successor

The Finance Committee reported that the amount of money still remaining from the proceeds of the $18,000,000 of second-mortgage bonds and other cash assets specifically applicable to the liquidation of the indebtedness stated in the circular to the preferred stockholders, dated Oct. 17, 1883, was $5,171,991.10. The obligations against the company, together with the balance of the amount required for construction and equipment, it was also reported, amounted to $4,015,834.04, showing a surplus of $1,156,157.06. In addition to this, it was stated that the company had on hand in cash the special fund applicable for the payment of interest on its general first-mortgage bonds, due July 1 amounting to $1,200,000.

Vice President Oakes made a long report concerning his recent inspection of the main line and branches of the Northern Pacific road. The inspection, he said, was made, entirely by daylight, and, consumed nearly three weeks of time. He found the road-bed and track in first-class order, with the exception of the 100 miles of road last completed west of Helena. That section yet requires ballasting with gravel, which can be done for about $80,000. The motive power and rolling stock of the road, Mr. Oakes said, were mostly in good order. He estimated that for $421,274 the older engines and passenger and freight cars could be put in excellent shape for use. The following table of earnings and expenses of the road from June 30 to Dec. 31, 1883, was submitted:

Gross earnings	$6,638,983	
Operating expenses, including rentals and taxes, improvements and betterments, to Oct. 31, 1883	4,427,690	—$2,211,293
Estimated gross earnings for balance of the fiscal year	7,050,000	
Estimated operating expenses, including rentals and taxes for balance of fiscal year, improvements and betterments being included in operating expenses	3,923,000	— 3,127,000
Total		$5,338,293
Interest charges for entire fiscal year as per estimate		3,882,341
Surplus		$1,055,952

The estimated interest charges for the fiscal year ending June 30, 1883, amount to $3,882,341. Mr. Oakes reported that of through business the tonnage from Eastern terminal points to the Pacific coast for the three months ending November last was 19,686,163 pounds. The east-bound tonnage for the same period was 3,475,767 pounds. Total both ways, 23,161,930. The freight business on the Eastern Division was said to have been gratifying thus far. The cattle shipments for the fall of 1883 amounted to 1,517 cars. The wool shipments from Montana were 2,505,474 pounds and the hide shipments 1,702,116 pounds, showing an increase of 53 per cent. in the shipments of wool and 112 per cent. in the shipments of hides. Most of this business goes east by way of Duluth. The wheat shipments since July 1 amounted to 263,390,761 pounds (4,389,849 bushels), an increase over 1882 of 90,550,294 pounds (1,509,171 bushels). Mr. Oakes estimated that there still remained of this season's crop, to be shipped after Jan. 1, 2,500,000 bushels.

It was also reported by Mr. Oakes that the statistics of emigration for the past two or three months indicated that about 30 per cent. of the entire emigration to the northwest Pacific coast sought the Puget Sound country. From information obtained from farmers in Minnesota and Dakota, it was estimated that the acreage of next season will be from 25 to 30 per cent. increase over the last year. The mineral sections along the Northern Pacific Railroad were said to be rapidly developing. The mining output for 1884 of the Territory of Montana was estimated by Mr. Heuser, President of the First National Bank at Helena, at $30,000,000 — more than double that of the past year. Mr. Oakes called attention to the arrangement with the Transcontinental Association—which embraces all lines engaged in overland transportation—by which Portland, Oregon, and San Francisco were made common points, the Northern Pacific receiving a proportion of the Portland business. This plan, he said, had been tried as an experiment in order to determine what share of the San Francisco business the Northern Pacific could properly claim in the prospective pool. The plan had not worked satisfactorily, and it had been decided that a natural division of territory would be more equitable to all concerned.

Ohio Central.—This company defaulted in the payment of the interest on the first-mortgage bonds on Jan. 1. The property of the company is already in the hands of a receiver in consequence of a default on Sept. 1 on the bonds of the River Division and on the floating debt, payment of which was demanded at about the same time. Persons who presented coupons of the main line bonds at the Metropolitan National Bank in New York were referred to the present receiver of the road.

Oregon & California.—This road is now in operation for 404 miles southward from Portland, Oregon, and track is laid for 30 miles further, to Central Point, in the Rogue River Valley, which will be turned over to the operating department very soon. The extension from the old terminus at Roseburg has been 128 miles, on which the following stations have been located: Greenville, Dillards, Oak Grove, Myrtle Creek, Riddle, Nichols, West Fork, Glendale, Almaden, Alta, Jump-off-Joe, Grant's Pass, Woodville, Gold Hill and Fort Lane. The grading is nearly completed to Ashland, 143 miles south of Roseburg, and track will be laid to that point probably this month. Much work has been done south of Ashland, including two tunnels in the Siskiyou Range near the southern boundary of the state. It is expected that the road will be finished to the California line this year, and that the Oregon Division of the Central Pacific will also reach the same point, thus completing a north and south line on the Pacific Coast from San Diego to Puget Sound.

The progress made on this road during the year has been remarkable, considering the difficult nature of the work, which is through a very hilly and rugged country. In a distance of 40 miles nine tunnels were required, two of them being over a mile long taken together, while much other heavy work was needed.

Oregon Improvement Co.—The statement of this company (owning and operating the Pacific Coast Steamship Co., the Pacific Coast Railway Co., the Columbia & Puget Sound Railroad Co., and the Seattle Coal & Transportation Co.) for November and the fiscal year ending Nov. 30 is as follows:

	—November.—		—Year.—	
	1883.	1882.	1883.	1882.
Earnings	$384,247	$340,058	$4,089,356	$3,361,277
Expenses	231,509	249,504	2,742,494	2,265,613
Net earnings	$152,738	$90,554	$1,346,862	$1,095,664
Per cent. of exps.	60.3	73.4	67.1	67.4

For the year there was an increase of $728,079, or 21.7 per cent., in gross receipts, and an increase of $476,881, or 21.0 per cent., in expenses, resulting in a gain of $251,198, or 22.9 per cent., in net earnings.

Oregon Railway & Navigation Co.—This company makes the following statement for December and the six months of its fiscal year from July 1 to Dec. 31:

	—December—		—Six months.—	
	1883.	1882.	1883.	1882.
Earnings	$427,500	$280,650	$3,259,454	$2,747,811
Expenses	271,500	212 881	1,636,750	1,332,204
Net earn.	$156,000	$67,769	$1,582,704	$1,415,607
Pr. cent. of exp's.	63.5	75.8	51.1	48.5

For the six months this gives an increase of $491,643, or 17.9 per cent., in gross earnings; an increase of $324,546, or 24.4 per cent., in expenses, and a resulting gain in net earnings of $167,097, or 11.8 per cent.

Ottawa, Waddington & New York.—This company has filed articles of incorporation in New York to build a railroad from some point in the village of Canton, St. Lawrence County, to Waddington and thence to the north side of Ogden Island, or to a point on the St. Lawrence River opposite Gooseneck Island, to connect with a bridge across the St. Lawrence River proposed to be constructed by the Ottawa, Waddington & New York Railway & Bridge Co., a corporation created and authorized to that end by the Dominion government of Canada. The length of the proposed line is 20 miles, and the capital stock of the company is $1,000,000.

Pennsylvania.—Arrangements are being made to extend the Lewisburg & Tyrone Branch from its present terminus at Spring Mills, Pa., westward to Lemont, a distance of 14 miles.

Philadelphia & Reading.—This company's statement for November gives the following figures, the leased New Jersey Central road being included in 1883 and not in 1882:

	Railroad Co.	Coal & Iron Co.	Both Co.'s.
Gross earnings	$3,654,616	$1,756,585	$5,411,501
Expenses	1,581,435	1,363,380	2,944,815
Net earnings	$2,073,481	$393,205	$2,466,686
Net earn., 1882	1,104,565	303,121	1,407,686
Increase	$968,016	$90,084	$1,059,000
Per cent	87.7	29.7	75.2

The expenses above do not include anything for interest or rentals, the net earnings being the amount from which those charges are to be paid.

The division of earnings between the Reading lines proper and the New Jersey Central for the month is as follows:

	Reading.	Central.	Total.
Earnings	$2,486,095	$1,168,821	$3,654,916
Expenses	1,076,074	505,361	1,581,435
Net earnings	$1,410,021	$663,460	$2,073,481
Central rental		539,053	539,053
Surplus for the month		$124,407	$1,534,428

The increase in net earnings on the Reading lines alone for the month was $305,456, or 27.6 per cent.

The traffic reported for the month was as follows:

	—1883.—			1882.
	Reading.	Central.	Total.	Reading.
Passengers carried	1,077,605	775,008	1,852,613	945,382
Tons freight carried	537,544	278,726	816,270	632,051
Tons coal carried	832,948	466,923	1,299,871	864,428
Tons coal on colliers			52,477	53,609
Tons coal mined:				
By Coal & Iron Co.			513,133	459,795
By tenants			135,008	140,544
Total			648,141	600,339

The coal mined from the lands of the Coal & Iron Co. thus formed 49.9 per cent. of the total coal tonnage carried, or 77.8 per cent. of that carried over the Reading lines proper.

The statements for the fiscal year ending Nov. 30 will be found elsewhere.

Pittsburgh & Allegheny Central.—This company has filed articles of incorporation to build a railroad from Chartiers, in Allegheny County, Pa., eastward to New Salem, in Westmoreland County, a distance of about 40 miles, through a coal country.

Providence Terminal Facilities.—The City Council of Providence, R. I., has approved the report of the commission which was appointed some time ago to consider the question of terminal facilities for the roads entering that city. The report recommended the building of a union passenger station for the different roads, near the present passenger station, and of freight stations on adjoining property. The plan requires the closing of several streets, the opening of others and the purchase of some valuable property. The total cost of the proposed improvements will be about $3,000,000, to be divided between the railroads and the city.

Rio Grande.—The receivership of this road, which has lasted for nine years, has finally been closed and the road restored to the stockholders. Under the receivership the debt of the company has been entirely cleared off. The road is 22 miles long and of 3 ft. 6 in. gauge, extending from Point Ysabel, Tex., to Brownsville on the Rio Grande.

St. Joseph & Western.—The receivership recently constituted for this road has been extended over the Hastings & Grand Island Branch, which was covered by a separate mortgage. The necessary proceedings under this mortgage have been taken.

Securities on the New York Stock Exchange.—The following securities have been put on the lists at the New York Stock Exchange:

Chicago, Milwaukee & St. Paul, $1,300,000 Wisconsin & Minnesota Division bonds.

Gulf, Colorado & Santa Fe, $384,000 additional first-mortgage bonds on 32 miles of new road.

New York, West Shore & Buffalo, $14,750,000 additional first-mortgage bonds, making the entire issue of $50,000,000 now listed.

Oregon & Transcontinental Co., $2,000,000 additional trust bonds, secured by deposit of branch line bonds

St. Paul, Minneapolis & Manitoba, $1,402,000 additional consolidated bonds.

Texas & New Orleans, $5,000,000 stock, $1,620,000 main line first-mortgage bonds and $2,075,000 Sabine Division bonds.

South Pennsylvania.—The Pittsburgh *Chronicle-Telegraph* of Jan. 8 says: "A new location for the Western Division of the South Pennsylvania Railroad west of Mount Pleasant has been surveyed, by which 12 miles in distance is saved. By the new route the road will diverge from the former surveys along the Sewickley beyond Paintersville, and, tending in a northwestwardly direction, strike the Pittsburgh, McKeesport & Youghiogheny road at a point a mile west of McKeesport. This route will probably be adopted."

Union Pacific.—This company's statement for November and the eleven months ending Nov. 30 gives the following figures, including the earnings and expenses of the leased lines:

	—November.—		—Eleven months.—	
	1883.	1882.	1883.	1882.
Earnings	$2,731,722	$1,711,916	$27,353,779	$27,804,921
Expenses	1,708,884	2,690,861	14,939,283	14,696,728
Net earnings	$1,022,838	$1,021,055	$12,414,496	$13,108,193
Per ct. of exps.	62.6	62.4	54.6	52.9

For the eleven months this shows a decrease of $451,142, or 1.7 per cent., in gross earnings, with an increase of $242,555, or 1.7 per cent., in expenses, the result being a decrease in net earnings of $693,697, or 5.3 per cent.

Xenia, Sandusky & St. Louis.—A railroad by this name is proposed to run from Xenia, O., northward through Piqua to Minster, the terminus of a branch of the Lake Erie & Western road. The distance is about 60 miles.

Yadkin Valley.—It is proposed to build a railroad from Salisbury, N. C., northward through the Yadkin Valley about 45 miles to a connection with the proposed extension of the Cape Fear & Yadkin Valley road to Mt. Airy.

Zanesville, McConnellsville & Pomeroy.—This company has been organized to build a railroad from Zanesville, O., southeast down the west bank of the Muskingum River to Harmar, on the Marietta Branch of the Cincinnati, Washington & Baltimore road. The distance is 72 miles.